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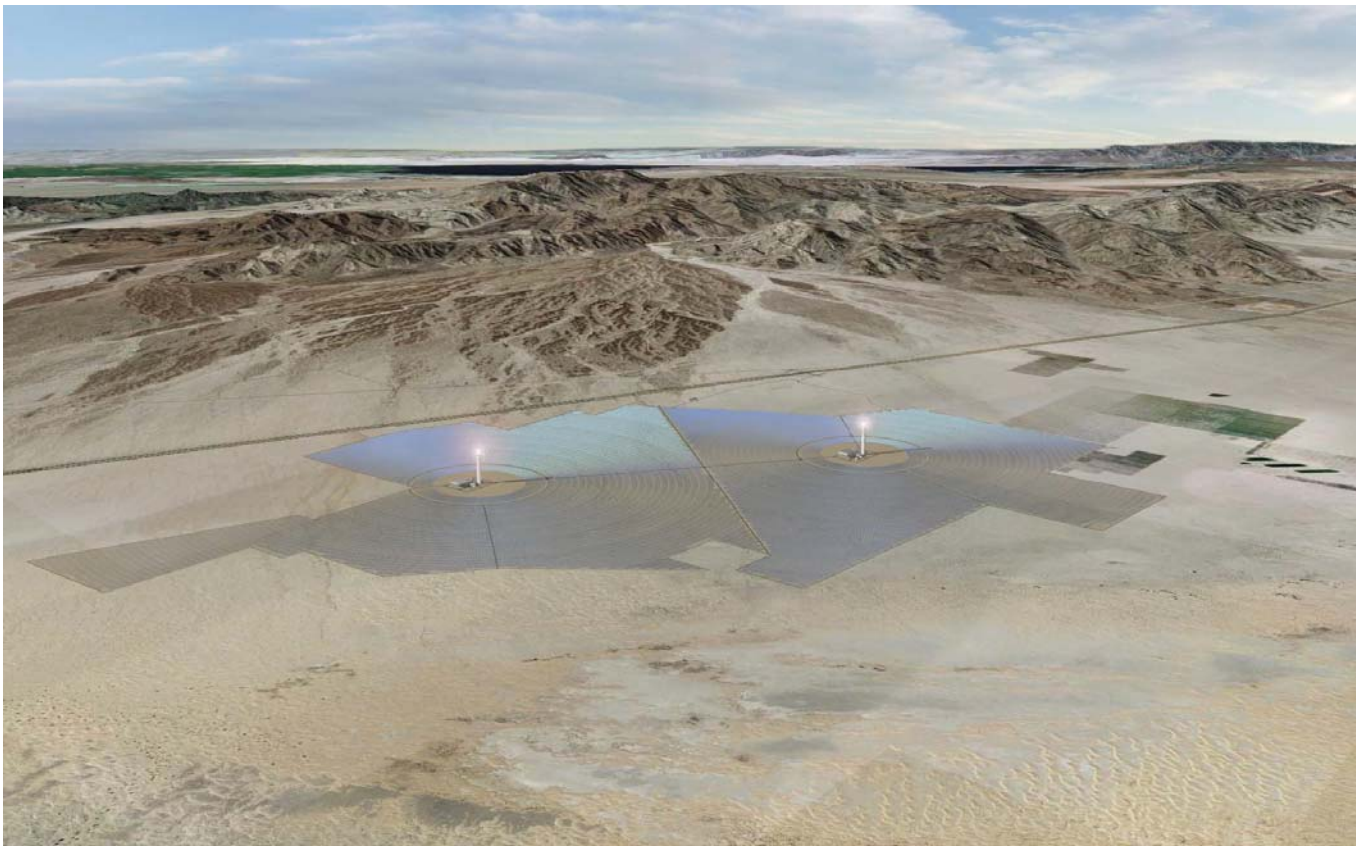
PALEN SOLAR ELECTRIC GENERATING SYSTEM

Final Staff Assessment for the Palen Solar Electric Generating System, Part B

Amendment to the Palen Solar Power Project



CALIFORNIA
ENERGY COMMISSION
Edmund G. Brown, Jr, Governor

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DOCKET NUMBER 09-AFC-7C

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EXECUTIVE SUMMARY

Testimony of Christine Stora

INTRODUCTION

This Final Staff Assessment (FSA) Part B is being published by California Energy Commission (Energy Commission) staff for the proposed amendment to the Palen Solar Power Project (PSPP). The modified project, owned by Palen Solar Holdings, LLC (PSH), is now called Palen Solar Electric Generating System (PSEGS) and proposes to change the solar thermal power-generating technology of the approved project from parabolic trough technology to solar power tower technology.

This FSA Part B contains staff's independent, objective evaluation of PSH's Petition to Amend (09-AFC-7C) for Cultural Resources. The staff analyses in the FSA are similar to those normally contained in an Environmental Impact Report (EIR) required by the California Environmental Quality Act (CEQA) except they also include an engineering assessment.

The FSA Part A was published on September 10, 2013 and contains the Project Description; Biological Resources; Hazardous Materials Management; Land Use; Noise and Vibration; Public Health; Socioeconomics; Soil and Water Resources; Traffic and Transportation; Transmission Line Safety and Nuisance; Visual Resources; Waste Management; Worker Safety and Fire Protection; Facility Design; Geology and Paleontology; Power Plant Efficiency; Power Plant Reliability; and Transmission System Engineering.

Part C (Air Quality) of the FSA will be published 30 days after staff receives the Preliminary Determination of Compliance (PDOC) from the South Coast Air Quality Management District (SCAQMD). Currently, staff has not received this document.

For an amendment for an existing power plant over which it has regulatory oversight, the Energy Commission is the lead state agency under CEQA. The Energy Commission's certified regulatory program provides the environmental analysis that satisfies CEQA requirements. In fulfilling this responsibility, Energy Commission staff provides an independent assessment of the amendment's engineering design, evaluates its potential effects on the environment and on public health and safety, and determines whether the project, if modified, would remain in conformance with all applicable local, state, and federal laws, ordinances, regulations and standards (LORS). Energy Commission staff also recommends any needed modifications to existing mitigation measures (known as conditions of certification) in the Energy Commission Final Decision and proposes additional conditions of certification to mitigate any significant adverse environmental effects of the proposed modifications.

For the ease of the reader, this FSA provides a description of the environmental setting of the entire project. However, because this is an amendment to an existing Energy Commission license, staff's analysis focuses on the technology change proposed for the PSEGS in the Petition to Amend. These specific changes are explained in detail in the

PROJECT DESCRIPTION section provided in the FSA Part A. A summary of the PSEGS project is provided below.

This FSA is not the decision document for these proceedings, nor does it contain findings of the Energy Commission related to environmental impacts or the project's compliance with local, state, and federal LORS. This document will serve as staff's testimony in evidentiary hearings to be held by the assigned Committee. In the evidentiary hearings, the Committee will consider the testimony presented by staff, the applicant, and intervenors, and will also consider the comments and recommendations of governmental agencies, tribes, and the public prior to submitting its proposed decision (Presiding Member's Proposed Decision [PMPD]) to the full Commission. Following a public hearing(s), the full Energy Commission will make a final decision on the proposed modifications.

PROPOSED PROJECT LOCATION AND DESCRIPTION

On December 17, 2012, the project owner filed a Petition to Amend with the Energy Commission requesting to modify the PSPP (http://www.energy.ca.gov/sitingcases/palen/compliance/). The PSPP, as licensed by the Energy Commission on December 15, 2010, is a 500-megawatt (MW) solar thermal power-generating facility utilizing parabolic trough technology. The project site is approximately 3,794 acres in size and is located approximately 0.25 mile north of Interstate 10, approximately 10 miles east of Desert Center and approximately halfway between the cities of Indio and Blythe, in Riverside County, California.

The modifications proposed in the 2012 Petition to Amend include replacing the parabolic trough solar collection system and associated heat transfer fluid with BrightSource's solar tower technology. Heliostats—elevated mirrors guided by a tracking system mounted on a pylon—focus the sun's rays on a solar receiver steam generator (SRSG) located atop a 750-foot tower near the center of each solar field to create steam to drive a turbine that generates electricity.

The modified project, the PSEGS, would be comprised of two adjacent solar fields and associated facilities with a total combined nominal output of approximately 500 MW. The project owner proposes to develop PSEGS in two operational phases. Each phase would consist of one solar field and power block with approximately 250 MW of generation capacity. Each solar field would have an array of approximately 85,000 heliostats for a total of 170,000 heliostats for the project. Each phase would also share common facilities, including an administration building, warehouse, evaporation ponds, maintenance complex with a meter/valve station for incoming natural gas service to the site, an on-site switchyard, and a single-circuit 230-kV generation tie-line to deliver power to the electricity grid. Other on-site facilities would include access and maintenance roads (either dirt, gravel, or paved), perimeter fencing, tortoise fencing, and other ancillary security facilities.

The PSEGS amendment does not propose to change the generating capacity of the PSPP, or the site access, or the interconnection point at the Red Bluff Substation, although there would be a slight re-routing of the generation tie-line near the western

end of the route and around the newly constructed Red Bluff Substation. A new natural gas pipeline is also proposed.

PURPOSE AND NEED FOR AN AMENDMENT

PSH acquired the PSPP site in order to develop BrightSource's proprietary solar thermal tower technology on the site. This change in technology could not have been anticipated during the original permitting process because, at the time of the original licensing, the project was owned by Solar Millennium and was to use parabolic trough technology. The Energy Commission approved the change in ownership for the PSPP project on July 11, 2012.

U.S. BUREAU OF LAND MANAGEMENT COORDINATION

The PSEGS is proposed to be located entirely on public land managed by the Bureau of Land Management (BLM). A Record of Decision (ROD) and Right of Way (ROW) grant from BLM, in addition to an Energy Commission license, would be required before the proposed project could commence construction. During the PSPP proceeding in 2009 and 2010, Energy Commission staff and BLM staff worked closely together on the review and analysis of the PSPP. The Energy Commission and BLM staff issued a joint Draft Environmental Impact Statement/Staff Assessment (DEIS/SA) for the PSPP on March 18, 2010. The DEIS/SA contained the Energy Commission staff's and BLM's environmental, public health, and engineering evaluation of the PSPP.

During the original licensing case, the Energy Commission and BLM determined that they would develop and publish separate final documents. On May 13, 2011, the BLM Published a Notice Of Availability (NOA) of the Final Environmental Impact Statement for the PSPP in the Federal Register. BLM never made a final decision on the PSPP; therefore, neither a ROD nor a ROW grant was issued.

On February 8, 2013, the BLM received a Revised Plan of Development for the PSEGS from PSH. The BLM issued the PSEGS Plan Amendment/Draft Supplemental Environmental Impact Statement on July 27, 2013. If the project is approved by the BLM, the BLM will issue a ROD and a ROW grant for the PSEGS.

Currently, the project owner is preparing a draft Reclamation & Decommissioning Plan for the project and will submit the plan to BLM prior to the release of the Final EIS. This document, in conjunction with the **General Conditions** in FSA Part A, will outline the requirements for facility closure of PSEGS.

Although the Energy Commission and BLM are not publishing a joint document for the PSEGS, the Energy Commission and the BLM continue to share staff expertise, information, and documentation in order to promote intergovernmental coordination at the state, and federal levels.

CUMULATIVE IMPACTS

Information on cumulative Impacts can be found in the FSA Part A.

ENVIRONMENTAL JUSTICE

Information on Environmental Justice can be found in the FSA Part A. Cultural Resources Environmental Justice as it relates to the Native American population is provided below.

Native American Environmental Justice

Federal Environmental Justice (EJ) guidance directs agencies to consider to the extent practicable whether there is or will be an impact on the natural or physical environment that significantly (as employed by the National Environmental Policy Act) and adversely affects Indian tribes. Such effects may include ecological, cultural or social impacts on Indian tribes when those impacts are interrelated to impacts to the natural or physical environment. Agencies must also consider whether environmental effects are significant (as employed by the National Environmental Policy Act) and are or may be having an adverse impact on Indian tribes that appreciably exceeds or is likely to appreciably exceed those on the general population or other appropriate comparison group.

Staff considers the Indian tribes affiliated to the Chuckwalla Valley (through ancestral or traditional use claims) to constitute EJ populations. It is precisely because Indian tribes maintain long-standing ancestral and traditional use practices and concepts connected to the environment and to their identities as Indian people, unlike other populations that do not have territories linked to their collective identities.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES AND MITIGATION

Below is a summary of environmental consequences and mitigation proposed in this FSA Part B. This section also provides a summary of outstanding information that will be analyzed in the FSA.

Executive Summary - Table 1
Environmental and Engineering Assessment

	PSPP Decision	PSPP Decision	PSEGS Amendment	PSEGS Amendment
Technical Area	**Complies with LORS**	**Impacts Mitigated**	**Complies with LORS**	**Impacts Mitigated**
Cultural Resources	Yes	**No**	Yes	**No**

CULTURAL RESOURCES

Staff's review of the Petition to Amend and multiple visits to the facility site and vicinity lead staff to conclude that the geographic scope of the original analysis for the project is insufficient to analyze the amended project's substantially greater visual intrusion in the Chuckwalla Valley. Staff believes that the proposed change to the project's technology, from a solar trough facility to a very bright, 750 foot-tall solar power tower facility, would significantly increase the distance from which the project would have the potential to compromise key elements of the integrity of historical resources that rely, in part, on relatively pristine natural landscapes to convey their association with important prehistoric and historic themes. Thus, staff has determined that an adequate evaluation

of the more far-reaching visual effects of the amended project requires the revision of the original Project Area of Analysis (PAA) to include all areas visible within approximately 15 miles of the two proposed solar power towers (see **Cultural Resources Figure 1** in the **Cultural Resources Section** in this FSA Part B).

The Cultural Resources Conditions of Certification have been revised to reflect changes to the licensed project. These changes include alterations to the physical footprint of the amended project and, significantly, to its vertical profile and the direct visual impact of this on cultural resources across Chuckwalla Valley. The tower height of the PSEGS effects many more cultural resources than the PSPP project which had a relatively low vertical profile. **CUL-1** has been augmented and **CUL-17** has been added to take the majority of the greater visual effects into account. **CUL-3** through **CUL-15**, which are relatively standard cultural resources conditions, remain largely unchanged. The elimination of **CUL-16** is a function of what staff perceives would be more efficient administration of the conditions as a whole.

Revisions to **CUL-1** provide for compensatory mitigation in the form of a number of different types of data recovery investigation for archaeological and ethnographic resources, the execution of a paleoenvironmental study to provide significant data to inform an interpretive context for the Chuckwalla Valley portion of the Pacific to Rio Grande Trails Landscape[1] (PRGTL), work to help emplace best management practices for the historic preservation of the landscape, and public outreach initiatives to interpret the landscape for the general public and to support Native American communities ancestral to the valley in their respective efforts to preserve the values that their different communities ascribe to resources of the subject landscape.

The adoption of **CUL-17** takes into account the visual potential of PSEGS to substantively degrade the historical significance of, respectively, potential contributors to an historic mining district, the Ironwood Historic Mining District. The implementation of **CUL-17** would provide for compensatory mitigation in the form of a number of different types of data recovery investigation for archaeological resources in one portion of the district, the Western Palen Mountains Mining Area, and for analyses of historically sampled mineral deposits in that area as key data to inform the interpretive context of the area.

[1] The PRGTL is a large cultural landscape that staff has identified for understanding human migration and settlement of the Americas. This cultural landscape accommodates three trail corridors from the Southern Pacific Coast of California, across the desert regions of Southern California, across the Colorado Plateau of the Southwest to the Northern Rio Grande Valley in what is now New Mexico. The middle corridor of the PRGTL runs through the PSEGS project site.

REFERENCES

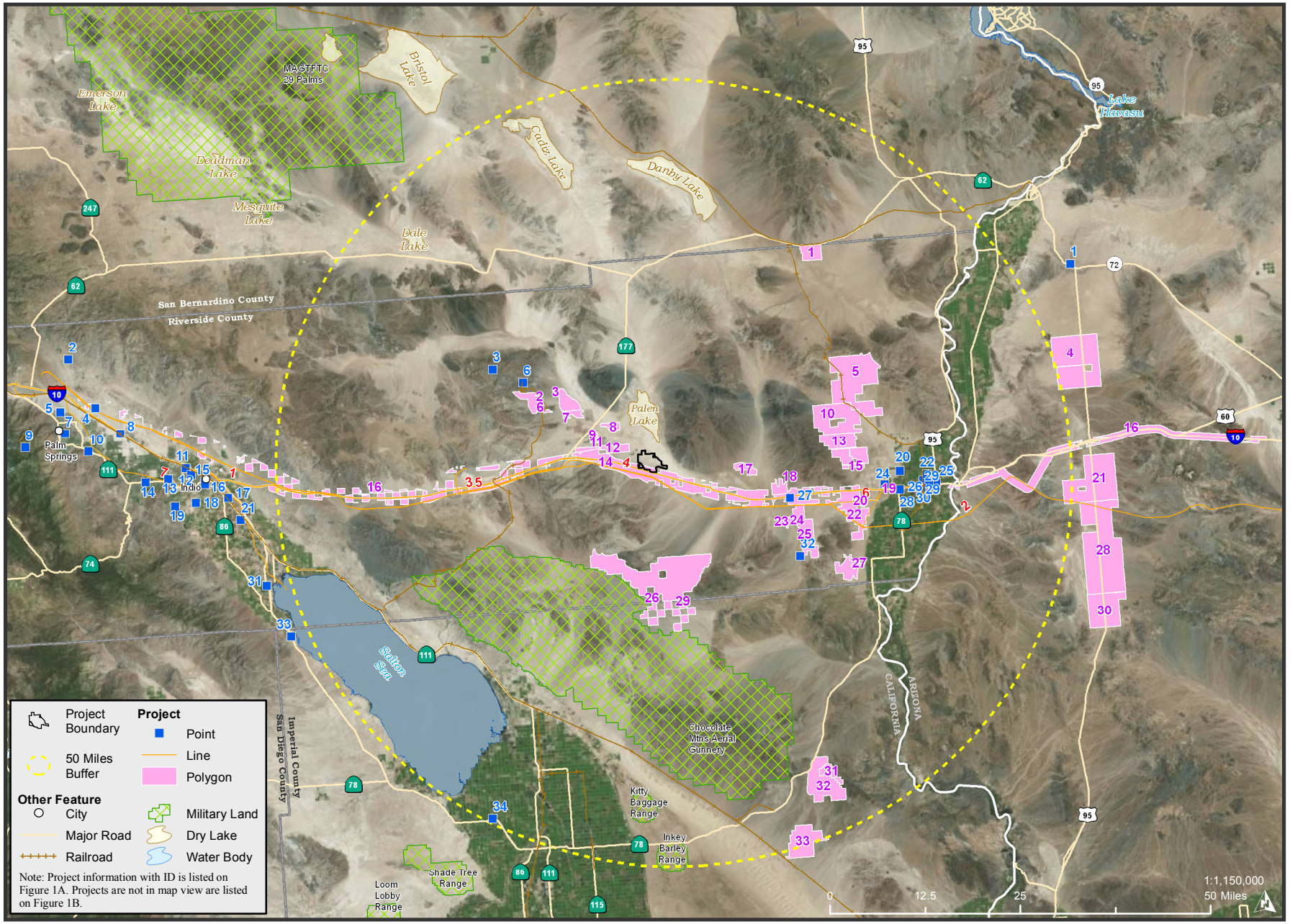
OPR 2013—The Governor's Office of Planning and Research (OPR), CEQAnet Database. Accessed May, 2013. On-line http://www.ceqanet.ca.gov/

Riverside County 2013—Riverside County Planning Department. Accessed May, 2013. On-line http://www.tlma.co.riverside.ca.us/planning/

Solar Millennium2009a—Solar Millennium (TN 52939). Application for Certification for the Palen Solar Power Plant, Vols.1 & 2, dated August 24, 2009.

EXECUTIVE SUMMARY ATTACHMENT A - FIGURE 1

Palen Solar Electric Generating System - FSA Cumulative Impacts



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Microsoft Bing Aerial, BrightSource, OpenStreetMap - June 2013, Bureau of Land Management - June 2013

EXECUTIVE SUMMARY ATTACHMENT A - FIGURE 1A

Palen Solar Electric Generating System – FSA Cumulative Impacts (Projects within the map view)

POINT							
LABEL ID	OID	PROJECT NAME	DISTANCE (MILE)	LABEL ID	OID	PROJECT NAME	DISTANCE (MILE)
1	85	La Paz Solar Tower	60.63	18	100	Music Festival Plan	59.54
2	157	Wenzlaff Elementary School Conversion	77.15	19	62	General Plan Update	62.32
3	84	Kaiser Mine	23.84	20	20	Blythe Solar Power Generation Station 1	32.61
4	104	North City Extended Specific Plan	72.81	21	45	District Community Education Support Complex	53.98
5	31	College of the Desert West Valley Campus Facilities Master Plan & Phase I Project	77.33	22	149	Twelve Residential Developments	36.18
6	48	Eagle Mountain Pumped Storage Project	19.54	23	32	Colorado River Substation Expansion	35.72
7	8	Aqua Caliente Roadway and Drainage Improvements Project	76.54	24	15	Blythe Energy Project	30.78
8	80	Interstate 10/Monterey Avenue Interchange Improvement Project	69.30	25	77	Intake Shell	37.44
9	5	Agua Caliente Indian Reservation	81.63	26	58	Four Commercial Projects	36.48
10	46	Eagle Canyon Dam and Debris Basin Project	73.35	27	160	Wileys Well Communication Tower	18.86
11	79	Interstate 10/Jefferson St Interchange Improvement Project	60.63	28	18	Blythe Mesa Solar I	32.78
12	59	Fred Waring Drive Improvement Project	59.94	29	68	Grant for LCNG Fueling Facility	35.55
13	76	Indian Wells Tennis Garden	63.00	30	145	Three Residential Developments	35.53
14	71	Hwy 111 Beautification and Improvement Project	65.94	31	72	Hwy 86 Domestic Water Transmission Main Phase 2 and Pump Station	52.60
15	51	East County Detention Center	58.15	32	121	Recreational Opportunities	23.07
16	70	Green River Communication Site	58.19	33	147	Travertine Point Specific Plan	52.10
17	30	Coachella General Plan Update	55.27	34	95	Mount Signal Solar Farm #1	50.84

LINE							
LABEL ID	OID	PROJECT NAME	DISTANCE (MILE)	LABEL ID	OID	PROJECT NAME	DISTANCE (MILE)
1	78	Interstate 10	1.28	5	17	Blythe Energy Project Transmission Line	1.92
2	43	Devers-Palo Verde No. 1 Transmission Line	1.87	6	41	Desert Southwest Transmission Line	24.09
3	69	Green Energy Express Transmission Line Project	1.88	7	83	Jurisdictional Delineation and Permits for Operations and Maintenance of Whitewater River Stormwater Channel and Coachella Valley Stormwater Channel	50.63
4	44	Devers-Palo Verde No. 2 Transmission Line Project	1.86				

EXECUTIVE SUMMARY ATTACHMENT A - FIGURE 1A (Continued)

POLYGON							
LABEL ID	OID	PROJECT NAME	DISTANCE (MILE)	LABEL ID	OID	PROJECT NAME	DISTANCE (MILE)
1	124	Rice Solar Energy Project	34.55	18	53	EnXco	17.21
2	87	LH Renewables Riverside County Type II	17.71	19	16	Blythe Energy Project II	30.82
3	42	Desert Sunlight Project	13.53	20	19	Blythe PV Project	27.82
4	117	Quartzsite Solar Energy	57.14	21	102	Nextlight Quartzsite	57.91
5	13	Big Maria Vista Solar Project	28.69	22	40	Desert Quartzite	27.55
6	49	Eagle Mountain Pumping Plant	15.56	23	81	Ironwood State Prison	18.81
7	38	Desert Harvest Solar Project	11.78	24	28	Chuckwalla Valley State Prison	19.95
8	39	Desert Lily Soleil Project	6.87	25	97	Mule Mountain III	22.04
9	27	Chuckwalla Valley Raceway	8.12	26	67	Graham Pass Wind Project	14.60
10	91	McCoy Soleil Project	24.96	27	113	Palo Verde Mesa Solar Project	29.26
11	36	Desert Center 50	7.95	28	86	La Posa Solar Thermal	60.04
12	26	Chuckwalla Solar I	6.40	29	93	Milpitas Wash	19.96
13	90	McCoy Solar Energy Project	24.82	30	158	Wildcat Quartzsite	62.34
14	133	SCE Red Bluff Substation	5.80	31	75	Imperial Wind	46.87
15	21	Blythe Solar Power Project	26.33	32	111	Oro Valley Wind	47.58
16	167	West-wide Section 368 Energy Corridors	0.00	33	108	Ogilby Solar	53.37
17	63	Genesis Solar Energy Project	12.47				

Note:
The distances from all the cumulative projects are calculated to the centroid of PSEGS. The distances between the line features of the cumulative projects are calculated by the shortest distance between the PSEGS centroid to the line features segments. The distances between the polygon features of the cumulative projects are calculated between the PSEGS centroid to the centroids of all the polygon features.

All distances are estimated.

EXECUTIVE SUMMARY ATTACHMENT A - FIGURE 1B

Palen Solar Electric Generating System – FSA Cumulative Impacts (Projects not in map view)

POINT							
ID	OID	PROJECT NAME	DISTANCE (MILE)	ID	OID	PROJECT NAME	DISTANCE (MILE)
1	2	6th Street/CA Avenue/Maple Ave Sewer Line Extension Project	102.53	23	60	General Plan Amendment No. 778, Change of Zone No. 7270, Tentative Tract Map No. 33248	132.27
2	3	ACI Residential Project	136.74	24	61	General Plan Update	108.42
3	4	Adoption of Rule 1406 Generation of ERCs for Paving Unpaved Public Roads	136.12	25	64	Gestamp Asetym Solar	352.62
4	6	Agua Caliente PV	110.87	26	65	Gilman Home Channel Lateral A, Stage 3 Project	96.41
5	7	Annex 114, SIA 12-001, GPA 12-004, CZ12-002 & ZTA12-002	130.06	27	66	Grading Environmental Assessment-EA42558	86.06
6	9	Beaumont Avenue Recharge Facility and Pipeline	103.16	28	73	I-215/Newport Road Interchange Improvement Project	113.00
7	10	Beaumont Distribution Center (City Project No. 12-PP-05, 12-RZ-02, and 12-GPA-01)	102.77	29	82	Joshua Palmer Realignment	101.11
8	11	Bella Linda General Plan Amendment, Zone Change/Planned Development Overlay	111.02	30	88	Longview Tank and Pipelines and Watson Booster Station and Pipelines	111.51
9	12	Belle Terre Specific Plan	108.02	31	89	March Business Center	117.59
10	22	Bundy Canyon Road and Orange Street Tentative Parcel Map No. 30522	119.02	32	94	Moreno Valley Field Station Specific Plan	115.90
11	23	Bundy Canyon/Scott Road Improvement Project	118.71	33	96	MSP for Pyrite Creek Trunk Sewer Phase II, Sky Country Trunk Sewer, and Force Main to Riverside WWTP	131.62
12	24	Cactus Avenue PUD	113.26	34	99	Murrieta Creek Phase 2	113.90
13	25	Canyon Lake Hybrid Treatment Process-Phase I	118.84	35	103	Non-Potable Water Service Expansion in the Eastern Portion of the District (DPR 3657DP)	130.69
14	29	Circulation Element General Plan Amendment	99.43	36	105	Oak Creek Canyon Residential Project	118.15
15	33	Corona Regional Medical Center Expansion	136.05	37	109	Operation of New Well #17	107.89
16	34	Crystal View Terrace/Green Orchard Place/Overlook Parkway Project	127.53	38	110	Optimus Logistics Center	117.61
17	35	Dawson Road Contractor's Storage Yard Plot Plan #2010-049	113.00	39	112	PA08-0097 (Plot Plan), PA08-0098 (Zone Change), PA09-0022 (TPM 36207, & PA10-0017 (Code Amendment)	114.24
18	52	EIR No. 512, Specific Plan No. 376 (Thoroughbred Farm)	135.45	40	114	Pelican 33-Acre Industrial Project	115.75
19	54	Expanded Gage Exchange Project	123.79	41	115	Perris Middle School and Central Kitchen	115.19
20	55	Fernando Child Care Center	131.21	42	116	Pyrite Channel Bypass	131.14
21	56	First Inland Logistics Center II	116.61	43	119	Ramona 49	107.34
22	57	Foothill Parkway Westerly Extension	138.71	44	120	Ramona Creek Specific Plan (SP-12-001)	104.43

EXECUTIVE SUMMARY ATTACHMENT A - FIGURE 1B (Continued)

POINT							
ID	OID	PROJECT NAME	DISTANCE (MILE)	ID	OID	PROJECT NAME	DISTANCE (MILE)
45	122	Recycled Water Ponds Expansion and Optimization Project	111.50	62	144	The Triangle Specific Plan (SP0-007-2452)	113.16
46	123	Recycled Water Program	116.90	63	146	Trails of Eastvale Residential Development	138.34
47	126	Riverside County Regional Medical Center, Nursing and Allied Health Education Building Project	115.13	64	148	Trumble Road Recycle Water Storage Expansion Project	114.20
48	127	RPT Centerpointe West Project	118.83	65	150	Upper Valle de Los Caballos Recharge Basins	106.10
49	128	San Gorgonio Pass Campus Master Plan	99.30	66	151	Van Buren Commercial Center Project Site	123.87
50	129	San Jacinto Master Drainage Plan Line C	100.96	67	152	Van Horn Youth Treatment & Education Center	129.91
51	130	San Jacinto Valley Master Drainage Plan and Amendment	98.96	68	153	Waite Street 1467 Zone Reservoir and Pipeline	118.83
52	132	Santa Ana River Bridge Seismic Retrofit	130.02	69	154	Wake Rider Beach Resort	124.89
53	134	Sierra Bella Specific Plan/Annexation	139.23	70	155	Water Reclamation Facility #2-Tertiary Filtration Project	135.52
54	135	Silverado Power I, II, III	342.12	71	156	Well Number 31 for Temescal Desalter	136.74
55	137	Starwood Solar 1	119.10	72	159	Wildomar 2014-2021 Housing Element Update and EIR	118.51
56	138	State Route 60/Potrero Boulevard New Interchange	101.01	73	161	Wine County Infrastructure Sewer Project	108.92
57	139	State Route 79 Realignment Project	103.30	74	162	World Logistics Center Project	113.14
58	140	State Route 91 Corridor Improvement Project	135.30	75	163	WR-34 Hydroelectric Power Generation Facility	112.48
59	141	Stratford Ranch Industrial Project	115.95	76	164	Wyle Laboratories Inc-Norco Facility	135.02
60	142	Temescal Canyon and Dawson Canyon Pipelines and Non-Potable Water Tank Project	131.20	77	165	Yuma Crude Oil Refinery	105.79
61	143	Tentative Tract Numbers 30386 and 30387	107.11	78	166	Sol Orchard Solar Farm Project	65.75

LINE							
ID	OID	PROJECT NAME	DISTANCE (MILE)	ID	OID	PROJECT NAME	DISTANCE (MILE)
1	92	Mid County Parkway Project	103.60	2	131	San Joaquin Rail Corridor 2035 Vision Project	176.58

EXECUTIVE SUMMARY ATTACHMENT A - FIGURE 1B (Continued)

POLYGON							
LABEL ID	OID	PROJECT NAME	DISTANCE (MILE)	ID	OID	PROJECT NAME	DISTANCE (MILE)
1	74	Imperial Solar Energy Center West	73.11	3	107	Ocotillo Wind Energy Facility	80.09
2	106	Ocotillo Sol	73.57	4	136	Sol Orchard	107.01

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All distances are estimated.

INTRODUCTION

Testimony of Christine Stora

On December 17, 2012, Palen Solar Holdings, LLC (PSH), filed the petition with the California Energy Commission requesting to modify the Palen Solar Power Project (PSPP). The PSPP, as licensed by the Energy Commission on December 15, 2010 (Order No. 10-1215-19, the "Final Decision," 09-AFC-7), was a 500-megawatt (MW) solar thermal power-generating facility utilizing parabolic trough technology. The PSPP encompassed approximately 4,366 acres located approximately one-quarter mile north of Interstate 10, approximately 10 miles east of Desert Center, and approximately halfway between the cities of Indio and Blythe, in Riverside County, California.

The modifications proposed in the petition include replacing the parabolic trough solar collection system with BrightSource's solar tower technology. Heliostats—elevated mirrors guided by a tracking system mounted on a pylon—focus the sun's rays on a solar receiver steam generator tower near the center of each solar field to create steam to drive a turbine that provides electricity.

In the petition, PSH also requested that the project name be changed from Palen Solar Power Project to Palen Solar Electric Generating System (PSEGS). In this document, the acronym, "PSPP," refers to the approved project, and the acronym, "PSEGS," refers to the proposed modified project.

AMENDMENT PROCESS

The purpose of the Energy Commission's review process is to assess the impacts of the proposed PSEGS on environmental quality and public health and safety. The Energy Commission will evaluate the impacts caused by the proposed changes to the approved project and will determine if the PSEGS would remain in compliance with applicable laws, ordinances, regulations, and standards (LORS) (Title 20, Calif. Code of Regulations, section 1769).

The petition will be processed as an amendment to the PSPP Final Decision.

PURPOSE OF THIS REPORT

This Final Staff Assessment (FSA) Part B is being published by the Energy Commission staff and is staff's final independent analysis of the petition to amend the Palen Solar Power Project (PSPP). This FSA is a staff document. It is neither a Committee document, nor a draft Decision. The FSA, as a whole, describes the following:

- the proposed modified project (PSEGS);
- the updated existing environment from the original decision;
- whether the modified facilities can be constructed and operated safely and reliably in accordance with applicable LORS;
- the environmental consequences of the modified project in conjunction with other existing and known planned developments;

- the potential cumulative impacts of the modified project in conjunction with other existing and known planned developments;
- modified and/or new conditions of certification proposed by the project owner, staff, interested agencies, local organizations, tribes, and intervenors which may lessen or eliminate potential impacts of the PSEGS;
- modified and/or new conditions of certification under which the project should be construction and operated, if the modified project is certified; and,
- project alternatives.

The analyses contained in this FSA Part B are based upon information from the: 1) Petition to Amend and Supplements to the Petition to Amend provided by the project owner, 2) responses to energy commission staff data requests, 3) supplementary information from local, state, and federal agencies, interested organizations and individuals, 4) existing documents and publications including the record from the approved PSPP, 5) independent research, 6) comments at public workshops, 7) comments received on the PSA and 8) other docketed communications. The analyses for most technical areas include discussions of proposed modifications to conditions of certification and new conditions of certification. Each condition of certification is followed by a proposed means of "verification." All changes to conditions to certification in the original decision are shown in this document so the reader can easily identify the changes being made to the project license. Deleted text to the conditions of certification is shown as ~~strikethrough~~, new text is **bold and underlined**.

The FSA serves as staff's testimony in evidentiary hearings to be held by the PSEGS Committee of two Commissioners who oversee this case. The Committee will hold evidentiary hearings and will consider the testimony presented by staff, the applicant, intervenors and the recommendations and comments provided by governmental agencies, tribes, and the public prior to proposing its recommended decision to the full Commission. Energy Commissioners will make a final decision on PSEGS, including findings, after the Committee's publication of the Presiding Member's Proposed Decision (PMPD).This FSA is intended to be a complete review of the modified project and in many cases relies on analysis that was prepared for the original PSPP. This information has been reviewed and updated to reflect current conditions and the setting that exists today. Although this document provides a full analysis of the project as a whole, this petition will be processed as an amendment to the PSPP Final Decision. Thus a Decision will only be made by the Energy Commission on the proposed changes to the existing PSPP certification.

ORGANIZATION OF THE FINAL STAFF ASSESSMENT PART B

This FSA Part B includes an Executive Summary, Introduction, and the Cultural Resources analysis.

The Cultural Resources section includes a discussion of: laws, ordinances, regulations and standards (LORS); the regional and site-specific setting; the modified project direct and cumulative impacts; proposed mitigation measures; conclusions and

recommendations; and modified and/or new conditions of certification for both construction and operation (if applicable).

The FSA Part A was published on September 10, 2013 and contains the Project Description; Biological Resources; Hazardous Materials Management; Land Use; Noise and Vibration; Public Health; Socioeconomics; Soil and Water Resources; Traffic and Transportation; Transmission Line Safety and Nuisance; Visual Resources; Waste Management; Worker Safety and Fire Protection; Facility Design; Geology and Paleontology; Power Plant Efficiency; Power Plant Reliability; and Transmission System Engineering.

Part C (Air Quality) of the FSA will be published 30 days after staff receives the Preliminary Determination of Compliance (PDOC) from the South Coast Air Quality Management District (SCAQMD). Staff has not received this document.

AGENCY AUTHORITIES, RESPONSIBILITIES, AND COORDINATION

The Energy Commission has the exclusive authority to certify the construction, operation and modification of thermal electric power plants 50 megawatts (MW) or larger within California. The Energy Commission certification is in lieu of any permit required by state, regional, or local agencies and by federal agencies to the extent permitted by federal law (Pub. Resources Code, § 25500 et. seq.). The Energy Commission must evaluate the impacts caused by the proposed changes to the approved project and will determine if the PSEGS would remain in compliance with applicable laws, ordinances, regulations, and standards (LORS) (Title 20, Calif. Code of Regulations, section 1769). However, the Energy Commission typically seeks comments from and works closely with other regulatory agencies that administer LORS that are applicable to the proposed project. The following paragraphs describe the agency coordination that has occurred throughout this amendment process.

Staff had multiple meetings with Native American Tribes, and staff coordinated with a number of other agencies including but not limited to U.S. National Park Service, U.S. Department of Defense, Caltrans, California Department of Public Health, California Department of Resources Recycling and Recovery (CalRecycle), California Division of Occupational Safety and Health (Cal-OHSA), California Office of Environmental Health Hazard Assessment (OEHHA), Colorado River Basin Regional Water Quality Control, South Coast Air Quality Management District, Riverside County, Riverside County Fire Department, Riverside County Sheriff's Department, Riverside County Airport Land Use Commission, and the San Bernardino and Riverside Counties Building and Construction Trades Council. Additional information regarding tribal consultation and agency coordination is provided in the technical sections of this FSA.

U.S. BUREAU OF LAND MANAGEMENT (BLM)

The PSEGS is proposed to be located entirely on land managed by the Bureau of Land Management (BLM) and will require a Right of Way grant from BLM in addition to the certification from the Energy Commission. During the original PSPP proceeding in 2009 and 2010, Energy Commission staff and BLM staff worked closely together on the review and analysis of the project. The Energy Commission and BLM staff issued a joint

Draft Environmental Impact Statement/Staff Assessment (DEIS/SA) for the Palen Solar Project on March 18, 2010. The DEIS/SA contained the Energy Commission staff's and BLM's environmental, public health and engineering evaluation of the proposed Palen Solar Project. On May 13, 2011, the BLM Published a Notice Of Availability (NOA) of the Final EIS for the Palen Solar Project in the Federal Register.

During the original licensing case, both the Energy Commission and BLM determined that they would develop and publish separate final documents. The Energy Commission released a Presiding Member's Proposed Decision on November 12, 2010 and approved the Application for Certification on December 15, 2010. BLM never made a final decision on the project and neither a Record of Decision (ROD) nor a Right of Way (ROW) grant was issued.

The BLM issued the PSEGS Plan Amendment/Draft Supplemental Environmental Impact Statement on July 27, 2013. If the project is approved by the BLM, the BLM will issue a ROD and ROW grant for the PSEGS.

Although the Energy Commission and BLM are not publishing a joint document, the Energy Commission and the BLM continue to share staff expertise, information and documentation to promote intergovernmental coordination at the local, state, and federal levels.

NATIVE AMERICAN CONSULTATION

Energy Commission Cultural Resources staff held meetings with affiliated tribes to exchange general information and to gauge tribal interest in participating in further project-related ethnographic studies. Staff based their invitations to tribal government representatives and individual traditional Native American practitioners upon a February 13, 2013 list provided by the NAHC and a separate March 12, 2013 list provided by the BLM.

On March 22, 2013 a general meeting was held at the BLM Corn Springs campground and the PSEGS project site. Energy Commission staff, BLM staff, and cultural resources staff from the Colorado River Indian Tribes, Agua Caliente Band of Mission Indians, Morongo Band of Mission Indians, San Manuel Band of Mission Indians and the Soboba Band of Luiseño Indians attended. Topics discussed at this meeting included project details, interest in further project participation, and sharing contact information.

On May 20, 2013 a meeting was held at the Agua Caliente Band of Cahuilla Indians office in Palms Springs. Energy Commission staff, BLM staff, and cultural resources staff from the Agua Caliente tribe attended. Topics discussed at this meeting included project schedule, the draft ethnographic report, and tribal concerns.

On May 21, 2013 a meeting was held at the Soboba Band of Luiseño Indians office in San Jacinto. Energy Commission staff, BLM staff, and cultural resources staff from the Soboba band were present. Topics discussed at this meeting included project schedule, the draft ethnographic report, and tribal concerns.

On May 23, 2013 a meeting was held at the PSEGS project site near Desert Center. Energy Commission staff and cultural resources staff from the Fort Mojave tribe attended. Topics discussed at this meeting included project details, project schedule, the draft ethnographic report, and tribal concerns particularly regarding the need for holistic landscape evaluations and why standard visual analysis is not adequate for understanding tribal landscapes.

On May 24, 2013 a meeting was held at the Quechan Indian Tribe office in Winterhaven, California. Energy Commission staff, the Quechan THPO, and the Quechan Cultural Committee were present. Topics discussed at this meeting included project details, interest in further project participation, the draft ethnographic report and tribal concerns. A Quechan Culture Committee member offered to provide expert witness testimony during the hearings for the PSEGS project should the need arise.

On June 20, 2013 a meeting was held at the Morongo Reservation. This meeting was a routine "all-Cahuilla" meeting. The PSEGS was one of several items on the meeting agenda. In addition to Energy Commission staff, cultural resources staff from the Morongo Band of Mission Indians, Torres-Martinez Desert Cahuilla Indians, San Manuel Band of Mission Indians, Soboba Band of Luiseno Indians and the Agua Caliente Band of Cahuilla Indians were in attendance. Staff's preliminary findings were discussed and it was announced that the Preliminary Staff Assessment was soon to be released.

On July 10, 2013 a meeting was held between the Quechan Tribal Council, Quechan Culture Committee and Energy Commission staff to explain the CEC regulatory process in general and as relates to the PSEGS. Specific cultural topics discussed were tribal "natural settings" and tribal methods for desert navigation and travel. The desire for the Quechan Culture Committee to provide an expert witness to support staff's testimony was further discussed.

The week of July 15th was spent in the Chuckwalla Valley conducting ethnographic resources assessments. All tribes were invited to participate and the Mojave Tribe and Quechan Tribe cultural resources staff participated in some of these field activities. Known sites were visited and several previously unknown sites were discovered. Ethnographic information was gathered concerning petroglyphs, natural settings and traditional methods for desert travel and navigation.

The week of August 12 was spent meeting with various tribes concerning multiple renewable energy projects, including the PSEGS. Meetings were held with the Colorado River Indian Tribes, the Quechan Tribe, the Fort Mojave Tribe and the Chemehuevi Tribe.

ENERGY COMMISSION'S PUBLIC ADVISER'S OFFICE

The Public Adviser advises the public on how to participate in the Energy Commission process, but does not represent members of the public. A representative of the Public Adviser's Office attended and presented information at the February 20, 2013 Informational Hearing and Site Visit. A representative also attended the workshops held

on April 17, 2013, May 1, 2013, July 17, 2013, July 22, 2013, July 25, 2013 and July 26, 2013, and the Tribal Consultation Meeting held on March 22, 2013.

COMMENTS

Written comments received during the amendment process are addressed in the FSA in the technical sections they apply to. Below is a table summarizing the comments that were received during the PSA comment period.

Table 1- Agency, Intervenor, and Public Comments for PSEGS

Palen Solar Electric Generating System 09-AFC-7C																						
DATE	DOCUMENT	Air Quality	Alternatives	Biological Resources	Cultural Resources	Efficiency	Facility Design	Geology and Paleontology	Hazardous Materials	Land Use	Noise and Vibration	Public Health	Reliability	Socioeconomics	Soil and Water Resources	Suggestions/Requests	Support of the Project	Traffic and Transportation	Trans Line Safety & Nuisance	Transmission System Design	Visual Resources	Waste Management	Worker Safety & Fire Protection
1/21/2013	La Cuna de Aztlan Sacred Dites Protection Circle's Opposition to the Petition to amend for Palen Solar			X	X																		
2/6/2013	County of Riverside's Comment Letter																						X
3/15/2013	La Cuna de Aztlan Sacred Dites Protection Circle's Opposition to the Petition to amend for Palen Solar				X																		
3/26/2013	Agua Caliente Band Cahuilla Indians Letter re Invitation to Participate in CEC Tribal Consultation				X																		
3/29/2013	Center for Biological Diversity's Status Report		X	X	X											X							
3/29/2013	Basin and Range Watch Status Report No. 1			X																			
4/11/2013	Soboba Band of Luiseno Indians Cultural Resources Department Letter of Requests				X																		
4/24/2013	Veena Doijido - Public Comment			X						X					X								
5/1/2013	Email from Kevin Emmerich of Basin and Range Watch	X										X											
5/8/2013	Center for Biological Diversity's Second Status Report			X	X																		
5/8/2013	Intervenor Basin and Ranch Watch's Status Report Number Two	X	X	X								X									X		

Palen Solar Electric Generating System 09-AFC-7C																						
DATE	DOCUMENT	Air Quality	Alternatives	Biological Resources	Cultural Resources	Efficiency	Facility Design	Geology and Paleontology	Hazardous Materials	Land Use	Noise and Vibration	Public Health	Reliability	Socioeconomics	Soil and Water Resources	Suggestions/Requests	Support of the Project	Traffic and Transportation	Trans Line Safety & Nuisance	Transmission System Design	Visual Resources	Waste Management	Worker Safety & Fire Protection
5/21/2013	Center for Biological Diversity Status Report			X																		
7/1/2013	Park Ewing - Public Comment			X																		
7/11/2013	PSH's Initial Comments on PSA														X							
7/13/2013	USFWS Email, and sent from Palm Springs Fish and Wildlife Office			X																		
7/25/2013	Shaun Gonzales - Public Comment			X														X			X	
7/26/2013	Kenneth B. Waxlax - Public Comment				X												X					
7/29/2013	Center for Biological Diversity - Comments on Palen PSA			X											X							
7/29/2013	Colorado River Board of California- Comment on PSA			X											X							
7/29/2013	Tourism Ecnomics Commission/Morongo Basin Conservation Association	X		X										X								
7/29/2013	Colorado River Indian Tribes - Comments on PSA			X	X																X	
7/29/2013	Palen Solar Holdings Final Comments on the PSA	X		X	X				X						X			X				X
7/29/2013	Basin and Range Watch Comments on PSA		X	X	X			X													X	
7/30/2013	PSH's Supplemental Comments on the 07/26/13 Version of Condition of Certification BIO-17			X																		
7/30/2013	County of Riverside Comments on PSA			X	X				X	X				X				X			X	X	X

Palen Solar Electric Generating System 09-AFC-7C																							
DATE	DOCUMENT	Air Quality	Alternatives	Biological Resources	Cultural Resources	Efficiency	Facility Design	Geology and Paleontology	Hazardous Materials	Land Use	Noise and Vibration	Public Health	Reliability	Socioeconomics	Soil and Water Resources	Suggestions/Requests	Support of the Project	Traffic and Transportation	Trans Line Safety & Nuisance	Transmission System Design	Visual Resources	Waste Management	Worker Safety & Fire Protection
8/2/2013	Airport Land Use Commission's Comment on PSA																	X					
8/16/2013	County of Riverside Comments on Fire and Emergency Risk Assessment																						X
8/26/2013	Riverside County Waste Management Department																					X	
TOTALS		5	3	8	1	0	0	1	2	2	0	2	0	2	5	1	1	4	0	0	5	2	3

REFERENCES

CEC 2010b – California Energy Commission/A. Solomon (TN 58252). Revised Staff Assessment Part 1, dated September 1, 2010. Submitted to CEC/Docket Unit on September 1, 2010

CEC 2010c – California Energy Commission/A. Solomon (TN 58497). Revised Staff Assessment Part II, dated September 16, 2010. Submitted to CEC/Docket Unit September 16, 2010

CEC 2013a – California Energy Commission/C. Stora (TN 69756). CEC Staff's Data Request No. 1-18, dated March 1, 2013. Submitted to Applicant/Galati Blek LLP, Scott Galati on March 1, 2013

CEC 2013b – California Energy Commission/C. Stora (TN 70214). Status Update No. 1, dated April 4, 2013. Submitted to CEC/K. Douglas, D. Hochschild, R. Renaud on April 4, 2013

CEC 2013c – California Energy Commission/C. Stora (TN 70404). Data Request Set 2 (Nos. 19-39), dated April 19, 2013. Submitted to Scott Galati on April 19, 2013

CEC 2013d- California Energy Commission/C. Stora (TN 70824). Data Request Set 3 (Nos. 40-39), dated May 15, 2013. Submitted to Scott Galati on May 15, 2013

CEC 2013e – California Energy Commission/C. Stora (TN 70827). Status Update No. 2, dated May 15, 2013. Submitted to CEC/K. Douglas, D. Hochschild, Kenneth Celli on May 15, 2013

Palen 2012a – Palen Solar Holdings, LLC/Galati Blek, Scott Galati (TN 68910). Palen Solar Holdings LLC's Petition for Amendment, dated December 17, 2012. Submitted to CEC/C. Stora on December 18, 2012

Environmental Assessment

CULTURAL RESOURCES[1]

Testimony of Matthew Braun, Thomas Gates, Melissa E. Mourkas[2], and Michael D McGuirt

SUMMARY OF CONCLUSIONS

On December 17, 2012, Palen Solar Holdings, LLC (PSH) filed a Petition to Amend (Palen 2012A) with the Energy Commission requesting to modify the Palen Solar Power Project (PSPP).The PSPP, is a 500-megawatt (MW) solar thermal power generating facility utilizing parabolic trough technology. The modifications proposed in the Petition to Amend include replacing the parabolic trough solar collection system and associated heat transfer fluid with BrightSource's solar tower technology. Heliostats, pylon-mounted mirrors guided by a single tracking system, focus the sun's rays on a solar receiver steam generator (SRSG) atop a 750-foot tower near the center of each heliostat field to create steam, which drives a turbine to generate electricity. The modified project is called the Palen Solar Electric Generating System (PSEGS).

The original analysis of the PSPP's potential to physically damage cultural resources on the facility site and along the linear infrastructure largely stands, as do the conditions of certification that were meant to mitigate for that damage. The principal focus of the present analysis is the assessment of the potential visual effects that the PSEGS project would have on cultural resources away from the facility site.

In 2010, Energy Commission cultural resources staff analyzed cultural resources data for the then proposed PSPP and concluded that that project would have a significant direct effect on 49 resources either recommended eligible or assumed eligible for either the National Register of Historic Places or California Register of Historical Resources. These effects included:

- Physical damage to nine prehistoric archaeological sites, all potential contributors to a prehistoric cultural landscape (historic district) identified by staff and designated as the Prehistoric Trails Network Cultural Landscape (PTNCL);
- Physical damage to 40 historic-period archaeological sites, some of which are potential contributing elements to a historic-period cultural landscape (historic district) identified by staff and designated as the World War II Desert Training Center California-Arizona Maneuver Area Cultural Landscape (DTCCL); and
- Cumulative effects to the PTNCL and the DTCCL, resulting from the PSPP's physical damage to contributors to these assumed register-eligible resources.

[1] The text of the present analysis borrows liberally from the *Cultural Resources* section of the September 2010 Revised Staff Assessment, Part 2 (Tremaine and Bastian 2010). Staff decided to bring a lot of the contextual material forward from that document into this one primarily as a convenience to the reader in order to avoid excessive cross-references to another document.

[2] Amber L. Grady is the primary author of the built environment testimony. Melissa E. Mourkas, M.A., ASLA, is sponsoring the testimony of Ms. Grady, who is no longer an employee of the California Energy Commission.

Conditions of Certification were recommended in order to reduce and to mitigate for the anticipated physical damage to cultural resources; however, staff determined that cumulative effects would not be reduced to a less than significant level. The Commission Order 10-1215-19, adopted in December 2010, found that the benefits of the PSPP outweighed the immitigable significant direct, indirect and cumulative impacts which may result from its construction and operation.

Staff's original analysis found that the physical effects of PSPP's construction, when combined with similar effects from past, present, and reasonably foreseeable future projects, would be cumulatively considerable for cultural resources at both the local I-10 Corridor and regional levels. The original staff analysis estimated that more than 800 sites within the I-10 Corridor, and 17,000 sites within the Southern California Desert region, could potentially be damaged or destroyed by these projects. Mitigation can help compensate for such destruction, but often not to a less-than-significant level. To reduce, but not fully-mitigate, the anticipated physical damage to cultural resources, staff recommended the adoption of Conditions of Certification **CUL-1** and **CUL-2**. The purpose of **CUL-1** and **CUL-2** was to reduce PSPP's cumulative physical effects by setting up programs to define, document, and nominate to the National Register of Historic Places two cultural landscapes that PSPP shared with two other nearby solar projects (Blythe Solar Power Project (09-AFC-6C) and Genesis Solar Energy Project (09-AFC-8C)) that were also before the Energy Commission at that time. The cost of these programs was to be shared by the three projects based on the acreage that they would utilize, and, in the future, by any other renewable energy projects that would adversely affect either of those landscapes.

To mitigate PSPP's physical effects on the original facility site and along the linear infrastructure, staff recommended in September 2010 that the Energy Commission adopt cultural resources Conditions of Certification **CUL-3** through **CUL-15**. **CUL-3** identifies the people who would implement all of the conditions (except for **CUL-1** and **CUL-2)**, and **CUL-4** specifies the information the project owner would supply to them. **CUL-5** provides for the preparation and implementation of the Cultural Resources Monitoring and Mitigation Plan (CRMMP), which would structure and govern the implementation of the broader treatment program. **CUL-6** provides for the preparation of a final report to analyze, interpret, and document the ultimate results of the entire PSPP cultural resources management program. **CUL-7** would train project personnel to identify, protect, and provide appropriate notice about known and new potential cultural resources in the project construction area. **CUL-8** through **CUL-10** would provide construction monitoring and cultural resources avoidance and discovery protocols. **CUL-11** through **CUL-15** in the approved conditions of certification include staff's recommended mitigation treatment of historic-period and prehistoric resources in a manner that would reduce the severity of PSPP's direct effects to a less than significant level.

The Conditions of Certification have been revised to reflect changes to the licensed project. These changes include alterations to the physical footprint of the amended project and, significantly, to its vertical profile. Research and analysis on the resultant expanded project area of analysis (PAA) and the potential visual effects of the amended project on cultural resources beyond the facility site will continue beyond the publication of this FSA in efforts to facilitate staff oversight of the implementation of the conditions.

CUL-17 has been added to mitigate for impacts created by the expanded PAA of the amended project.

Staff's review of the Petition to Amend (Palen 2012A) and multiple visits to the facility site and vicinity lead staff to conclude that the geographic scope of the original analysis for the project is insufficient to analyze the amended project's substantially greater visual intrusion in the Chuckwalla Valley. Staff believes that the proposed change to the project's technology, from a solar trough to a very bright, 750 foot-tall solar power tower facility, would significantly increase the distance from which the project would have the potential to compromise key elements of the integrity of historical resources that rely, in part, on relatively pristine natural landscapes to convey their association with important prehistoric and historic themes. As a consequence of this belief, staff has determined that an adequate evaluation of the more far-reaching visual effects of the amended project requires the revision of the original PAA [see **PROJECT AREA OF ANALYSIS (PAA)** subsection, below] to include all areas visible within approximately 15 miles of the two proposed solar power towers (see **Cultural Resources Figure 1**).

At the time the PSA was published, staff's research on and analysis of the geographic area encompassed by staff's draft revision to the PAA was incomplete. Staff, variously in collaboration and consultation with the project owner, the California Desert District and Palm Springs-South Coast Field offices of the BLM, Joshua Tree National Park, and a number of local Native American communities, has been steadfastly engaged, since early January of 2013, in an effort to identify and to evaluate the historical significance of the cultural resources in what ultimately has become the final revised PAA.

ARCHAEOLOGY

The archaeological analysis in the **CULTURAL RESOURCES** section of the September 2010 Revised Staff Assessment, Part 2 primarily took into account the potential physical effects of the originally proposed project on archaeological resources that staff had either recommended as eligible for the California Register of Historical Resources (CRHR) or assumed to be eligible for the purpose of staff's CEQA analysis. These resources included two cultural landscapes with portions that include the physical footprint of the original project, nine prehistoric archaeological sites, and 36 historical archaeological sites. Measures to mitigate the original project's anticipated construction damage to these resources are found in **CUL-1**, **CUL-2**, and **CUL-11** through **CUL-15**, in addition to the Energy Commission's more standard Conditions of Certification **CUL-3** through **CUL-10**, the intent of which is to ensure that physical effects to any significant archaeological resources found during project construction and operation are taken into account, and, where those effects are severe, that such effects are to be mitigated to a less than significant level.

In staff's opinion, the difference in the visual profiles between the original project and the amended project is significant and is, consequently, the primary focus of the cultural resources analysis for the present amendment. The September 2010 archaeological analysis largely does not take into account the potential effects of the original project's visual intrusion in the Chuckwalla Valley due, primarily, to the relatively low vertical profile of the project's original solar trough configuration. The archaeological analysis in

the FSA for the proposed amendment will take into account whether, and the degree to which, the amended projects' solar power towers and the SRSGs may compromise the ability of archaeological resources to convey the significance of their associative or design values. Research was developed by the project owner, with staff guidance, to identify and to evaluate the historical significance of a sample of the archaeological resources that lie beyond the facility site but are close enough to the facility's solar power towers to be subject to the towers' significant direct visual effects. The fieldwork that would support the research was authorized by the BLM; however, due to less than satisfactory field conditions (rugged mountains in summertime temperatures), the project owner ultimately declined to conduct the complete complement of that fieldwork on a schedule that would have made the resultant data available to staff in time to incorporate in the present analysis. Critical to staff's analysis of the potential visual effects of the amended project were the portions of the authorized fieldwork that would have included the pedestrian survey and documentation of a small sample of the archaeological resource inventory for the broader Chuckwalla Valley floor and the adjacent Coxcomb and Palen mountains. As the project owner chose to delay the execution of this work, staff felt compelled to conduct an informal field reconnaissance itself of a very small portion of the amended project's view shed to try and garner some sense of the project's potential visual effects farther from the proposed facility site. One further result of staff's multiple field reconnaissance on and near the facility site for the amended project has been the realization that the amended configuration of the PSEGS in combination with the basic physiographic structure of Chuckwalla Valley combine to amplify the reach of the amended project's visual presence in the valley. This factor underpins staff's revisions here to the Conditions of Certification for archaeological resources, as well as for ethnographic and built-environment resources.

The revisions to the cultural resources Conditions of Certification in the FSA, as they relate to archaeological resources, are the culmination both of negotiations with the project owner to collect cultural resources information for the PAA and of what staff has learned first-hand about Chuckwalla Valley in its ongoing effort to acquire that information. **CUL-1** has been revised since the Preliminary Staff Assessment (PSA) to take into account the amended project's direct visual impacts on archaeological resources which may be elements that contribute to the significance of the Chuckwalla Valley portion of the Pacific to Rio Grande Trails Landscape (PRGTL), formerly the Prehistoric Trails Network Cultural Landscape (PTNCL). These direct impacts are in addition to the cumulative impacts that **CUL-1** took into account in the project's original license. **CUL-17** has been added since the PSA to take into account the amended project's potential to visually degrade the potential historical significance of a portion (Southwestern Palen Mountains Mining Area) of an historical resource tentatively referred to here as the Ironwood Historic Mining District.

ETHNOGRAPHY

The final analysis leads staff to suggest that there are at least 11 ethnographic resources in varying proximity to the project vicinity that could be adversely impacted by the construction, operation, non-operation or closure of the PSEGS facility:

1. Palen Dunes/Palen Lake

2. Ford Dry Lake

3. McCoy Spring (CA-RIV-0132) National Register District
4. Chuckwalla Spring (CA-RIV-0262)
5. North Chuckwalla Mountains Petroglyph District (CA-RIV-01383)
6. North Chuckwalla Mountains Prehistoric Quarry District (CA-RIV-01814)
7. Corn Spring (CA-RIV-032)
8. Long Tank
9. Alligator Rock
10. Dragon Wash (CA-RIV-049)
11. San Pascual Well

Staff considers these 11 ethnographic resources to be traditional cultural properties (TCPs), per definitions provided in National Register Bulletin 38 (NPS 1998), that are recommended as eligible for inclusion in the National Register of Historic Places, and to be considered "places," per definitions provided in the CEQA guidelines (Cal. Code Regs., tit. 14, § 15000 et seq.), that are also recommended as eligible for listing in the California Register of Historical Resources (CRHR). In addition, staff finds all 11 ethnographic resources to be contributors to a larger cultural landscape, an area that encompasses most of the Chuckwalla valley and that has archaeological sites and places (further detailed in the archaeological sections of this assessment) that also are contributors to the same cultural landscape that staff has attached the name the Chuckwalla Valley portion of the Pacific to Rio Grande Trails Landscape (PRGTL). The previously defined Prehistoric Trails Network Cultural Landscape (PTNCL) has been subsumed into the PRGTL. A revised **CUL-1** addresses conditions of certification to partially mitigate for impacts to the Chuckwalla portion of the PRGTL. However, staff does not believe that the impacts to the landscape can be mitigated to less than significant. In addition staff has not proposed separate mitigations for each of the 11 TCPs.

HISTORIC-PERIOD BUILT-ENVIRONMENT

The September 2010 Revised Staff Assessment, Part 2 concluded that no built-environment historical resources would be significantly impacted by the PSPP. Staff comes to the same conclusion in this FSA – no built environment historical resources would be significantly impacted by the PSEGS.

For staff's analysis of the PSEGS project, due to proposed modifications to the PSPP, the PAA has been expanded and additional historic-age resources have been examined. As a result of project owner and staff efforts, a total of 40 built-environment resources have been identified and evaluated. Fourteen of the resources are bridges built between 1931 and 1944; all of which are listed as ineligible for the NRHP and CRHR on the Caltrans Bridge Inventory. Eighteen of the resources of historic-age are various residential buildings, transmission lines and other structures also found to be

ineligible for listing on the NRHP and CRHR. Therefore, PSEGS would not result in a significant impact on these resources and no mitigation is recommended.

Eight of the 40 resources are associated with the Town of Desert Center. These resources were evaluated for possible inclusion in a potential Desert Center Historic District. Staff believes that the town, as a district, may be eligible for the local register and, therefore, may be considered a historical resource pursuant to CEQA. The town's eligibility is based on its development as a desert oasis along a 90-mile stretch of desert, half way between Blythe and Indio, in the early age of the automobile. Just as early prehistoric and historic trail networks across the desert were connected by springs, and later wells, the Town of Desert Center provided an important "pit stop" for the desert traveler in the early 20th century where gas, water, and other supplies could be obtained. However, staff determined that the visual impact of the PSEGS, approximately 7 miles away, would not have a significant impact on the town's eligibility as an historic district. Staff believes the impact to this resource would be less than significant and no mitigation is therefore recommended. The Eagle Mountain Pumping Station is a significant resource because of its association with the Colorado River Aqueduct and would be eligible for listing as an historic resource; Likewise, the Eagle Mountain Railroad is eligible for listing as an historic resource both individually and as part of a larger Eagle Mountain Mine and Company Town Historic District. However, staff believes that the visual impacts of the PSEGS would not be sufficient to result in these resources no longer being eligible for the CRHR. Staff believes that the impact to these resources would be less than significant and no mitigation is therefore recommended.

INTRODUCTION

This environmental assessment analyzes the potential impacts of the PSEGS project on cultural resources. The term "cultural resource" means any tangible or observable evidence of past human activity, regardless of significance, found in direct association with a geographic location, including tangible properties possessing intangible traditional cultural values. Historical resources are defined under California state law as including, but not necessarily limited to, any object, building, structure, site, area, place, record, or manuscript that is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the agency's determination is supported by substantial evidence in light of the whole record" [Cal. Code Regs., tit. 14, § 15064.5(a)]. Three kinds of cultural resources, classified by their origins, are considered in this assessment: prehistoric, ethnographic, and historic-period. Under federal and state historic preservation law, generally cultural resources must be at least 50 years old to have sufficient historical importance to merit consideration of eligibility for listing in the CRHR. A resource less than 50 years of age must be of exceptional historical importance to be considered for listing.

Prehistoric archaeological resources are associated with the human occupation and use of California prior to prolonged European contact. These resources may include sites and deposits, structures, artifacts, rock art, trails, and other traces of Native American human behavior. In California, the prehistoric period began over 12,000 years ago and

extended through the eighteenth century until 1769, when the first Europeans settled in California.

Ethnographic resources represent the heritage of a particular ethnic or cultural group, such as Native Americans or African, European, Latino, or Asian immigrants. They may include traditional resource-collecting areas, ceremonial sites, value-imbued landscapes and related features, cemeteries, shrines, or ethnic neighborhoods and structures. Ethnographic resources are variations of natural resources and standard cultural resource types. They are subsistence and ceremonial areas, places, sites, structures, and objects assigned cultural significance by traditional users. The decision to call resources "ethnographic" depends on whether associated peoples perceive them as traditionally meaningful to their identity as a group and the survival of their lifeways.

Historic-period resources, both archaeological and architectural, are associated with Euro-American exploration and settlement of an area and the beginning of a written historical record. They may include archaeological deposits, sites, structures, traveled ways, artifacts, or other evidence of human activity. Groupings of historic-period resources are also recognized as historic districts and as historic vernacular landscapes.

For the PSEGS project, staff provides an overview of the environmental setting and history of the project area from a cultural resources perspective, an inventory of the cultural resources identified in the project vicinity, and an analysis of the project's potential impacts to significant cultural resources in the PAA, using criteria from the California Environmental Quality Act (CEQA) and CEQA Guidelines.

If cultural resources are identified, staff identifies which are historically significant (defined as eligible for the CRHR or by other significance criteria) and whether the PSEGS would have a substantial adverse impact on those that are determined or assumed to be historically significant. Staff's primary concern is to ensure that all potentially significant cultural resources are identified, all potential project-related impacts to those resources are identified and assessed, and conditions are recommended that ensure that all significant impacts that cannot be avoided are mitigated to a less than significant level or to the extent feasible as required by CEQA.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Projects subject to the Energy Commission's licensing process are reviewed and conditions of certification are imposed, as needed, to ensure compliance with all laws, ordinances, regulations, and standards (LORS) that are applicable to the proposed project and related facilities, or would be applicable but for the Energy Commission's exclusive authority.

Cultural Resources Table 1
Laws, Ordinances, Regulations, and Standards

Applicable LORS	Description
Federal	
BLM-Cal SHPO-Project Owner Programmatic Agreement (PA)	Instrument adopted in 2010 (amended in 2013) between the BLM, the California State Historic Preservation Officer (SHPO), and Palen Solar I, LLC (owner) outlining protocols and obligations for treatment of historic and cultural resources on the PSPP, and coordination for compliance with Section 106 of the National Historic Preservation Act (NHPA).
State	
Government Code, section 62544.10 – California Public Records Act	Provides for non-disclosure of records that relate to archaeological site information and reports maintained by, or in the possession of, the Department of Parks and Recreation, the State Historical Resources Commission, the State Lands Commission, the Native American Heritage Commission, another state agency, or a local agency, including the records that the agency obtains through a consultation process between a California Native American tribe and a state or local agency.
Local	
Riverside County General Plan, Multipurpose Open Space Element, Policies O.S. 19.2-19.4	OS 19.2 requires that review of all proposed development for archaeological sensitivity; OS 19.3 employs procedures to protect the confidentiality and prevent inappropriate public exposure of sensitive archaeological resources when soliciting the assistance of public and volunteer organizations. OS 19.4 requires a Native American Statement as part of the environmental review process on development projects with identified cultural resources.
Riverside County General Plan, Multipurpose Open Space Element, Policies O.S. 19.5-19.7	OS 19.5 allows the History Division of the Riverside County Regional Park and Open Space District to evaluate large project proposals for their potential preservation or destruction of historic sites; requires projects to provide feasible mitigation for impacts to historic sites prior to county approval. OS 19.6 enforces the California State Historic Building Code so that historic buildings can be preserved and used without posing a hazard to public safety. OS 19.7 endorses the allocation of resources and/or tax credits to prioritize retrofit of historic structures.
Riverside County General Plan, Exhibit A, CEQA Findings of Fact and Statement of Overriding Considerations, Section 4.7, Mitigation Monitoring Program, Measures 4.7.1A, 4.7.1B, and 4.7.1C.	Outlines mitigation measures for cultural resources monitoring programs.

SETTING

Information provided regarding the setting of the proposed project places it in its geographical and geological context and provides the context for the evaluation of the historical significance of any identified cultural resources within the PAA (see “Project Area of Analysis (PAA)” subsection, below).

REGIONAL SETTING

The project site is in the southeastern Mojave Desert in the Sonoran section of the Basin and Range geomorphic province (California Geological Survey 2002, Fenneman and Johnson 1946). The region consists of broad, low-elevation, largely internally-draining basins, filled with alluvium, separated by isolated mountain ranges. The local sources of alluvium in these basins are typically the mountain ranges that bound them. The Colorado River slices through these basins approximately 42 miles to the east of the proposed facility site, and introduces characteristic features of riverine landscapes where it meanders among the local mountain ranges. Elevations in the region range from approximately 1,210 to 6,700 feet above sea level along mountain range ridges, from 610 to 830 feet above sea level on the bottoms of internally-draining basins, and from 230 to 540 feet above sea level along the Colorado River floodplain. The largely alluvial parent material of the region's alluvial fans, valley bottoms, and riverine terraces and floodplains, in conjunction with the desert climate of the region, generally support more weakly developed soil orders (Entisols and Aridisols) where a Colorado Desert Creosote Bush Scrub vegetation type often predominates (BS 2011a:5.2-44).

The project area falls in a region where, on the basis of different technical perspectives, it can be said to lie both in the Mojave Desert and the Colorado Desert. From a physiographic or geomorphic perspective, the project area is in the Mojave Desert, a subpart of the Basin and Range geomorphic province, where the desert boundary to the north is the Garlock Fault and the boundary to the south is the San Andreas Fault (California Geological Survey 2002, Fenneman and Johnson 1946). From a floristic perspective, the proposed project area is in the Sonoran Desert region of the Desert floristic province, also known as the Colorado Desert, where the basis for the region's classification are the distributions of particular vegetation associations (Baldwin et al. 2002). The composition and distribution of Colorado Desert vegetation associations are dynamic and fluctuate through time, in and out of the geomorphic area that has been defined as the Mojave Desert. References below, then, to the Mojave Desert largely concern the geology and geomorphology of the region, while references to the Colorado Desert reflect more concern for the present climate and the present distribution of index vegetation associations.

The present climate of the hot and arid Colorado Desert is classified as sub-humid or sub-tropical with evaporation greatly exceeding precipitation. Summer temperatures in July through September average above 86 degrees Fahrenheit with daytime maximum temperatures often nearing 110 degrees Fahrenheit and ground temperatures exceeding 140 degrees Fahrenheit. Winter temperatures are mild, averaging 50–70 degrees Fahrenheit in December through February. Precipitation is around three inches per year with substantial yearly variability between locations. The range of variability is from 0–10 inches. The weather patterns responsible for bringing rain to the California deserts are a combined result of two global-scale weather systems and a rain shadow effect by the major surrounding mountains (Peninsular, Transverse, and Sierra Nevada ranges). The dominant weather system during the winter months is the frontal pattern of the Pacific High. This brings generally clear skies with only occasional rain. The summer months are characterized by fluctuations between that high-pressure system and a tropical water laden convectional system coming off the Gulf of California. This

system sometimes brings very localized late afternoon and early evening thunderstorms.

PROJECT, SITE, AND VICINITY DESCRIPTION

The project site is in the northern Colorado Desert of eastern Riverside County. The following description is largely excerpted from McCarty (1980). The Colorado Desert covers approximately 11,000 square miles, divided among nine Bureau of Land Management units, including the Palen Planning Unit[3]. These units are almost entirely in a low, hot desert below 2,000 feet elevation. It is one of the harshest and most arid environments in North America (McCarty 1980, p. 4). The terrain consists of a number of broad shallow valleys that, in a general sense, trend to the southeast, draining into the Colorado River. These valleys contain five playas or closed basin sinks formed by the low-lying obstructions in the valley floor.

Valleys in the interior of the Colorado Desert planning units have been characterized morphologically as pediments, pediment plains, and base level plains with complicated geology of schists, granites, rhyolites, and basalts that make up the alkaline and often calcareous gravels and soils (McCarty 1980, p. 7). These valleys surround and isolate a number of small, severely weathered mountain ranges. These ranges, often barren exposures of rock outcrop, talus slopes, and steep dissected canyons, run generally north-south in the northern areas and northwest-southeast in the southern portions. Peaks range to 4,000 feet in the north and 2,000 feet in the south.

The Chuckwalla Valley is classified as a long shallow valley system that is actually contiguous with Pinto Valley to the north. Under more pluvial conditions, these valleys had the potential to overflow their blockades and become a continuous drainage (McCarty 1980, p. 7). Today, water supply is limited to a very few springs and seeps in the mountains and higher washes. Groundwater in the deep sandy soils of the valleys usually requires extensive deep drilling and is well beyond the reach of vegetation.

Palen Dry Lake is divided by alluvium into a northwest and southeast section (Geologic Map of California, Salton Sea Sheet, 1967). The two sections are isolated in part by mountains and miles of dunes formed during the modern dry regime. Palen Lake Northwest receives water mainly from the Coxcomb Mountains that abut its northwest side. Palen Lake Southeast section is fed by drainage from the Eagle, Palen, Coxcomb, Chuckwalla, and Orocopia mountains. The PSEGS lies within the Palen Lake southeast section.

The project amendment proposes to convert the two approved solar trough plants for either Reconfigured Alternative No. 2 or 3 into two solar power tower plants each of which uses a field of heliostats to concentrate solar energy on a solar receiver steam generator (SRSG) elevated to a maximum height of approximately 750 feet above the floor of the Chuckwalla Valley.

[3] The Bureau of Land Management Colorado Desert Planning Units include: Imperial, Santa Rosa, Orocopia, Twentynine Palms, Bristol/Cadiz, Palen, Turtle Mountain, Whipple Mountain, Big Maria, and Picacho).

The maximum area of ground disturbance for the amended project would be less than that for the approved project. The licensed PSPP project alternatives ranged from approximately 4,365 acres for Reconfigured Alternative No. 2 to 4,330 acres for Reconfigured Alternative No. 3. The disturbance area for the amended project has been reduced to approximately 3,794 acres or approximately 571 acres less than Reconfigured Alternative No. 2 and 536 less than Reconfigured Alternative No. 3.

The proposed amendment to the project would reduce the overall amount of ground disturbance and require an internal reconfiguration of project infrastructure. The amended project would contain internal roadway and utility corridors for each of the two plant's heliostat fields and power blocks. Both plant sites would be accessible from 20-foot wide paved or hardscape access roads from the entrance of the amended project site to and around both power blocks. The project owner indicates that the construction of the amended project would reduce the volume of requisite earthwork by approximately 4.3 million cubic yards, because the construction of heliostat fields does not require the grading of expansive level terraces required for solar trough fields. While the approved alternatives included the use of private land, 240 acres for Reconfigured Alternative No. 2 and 40 acres for No. 3, the proposed amended project would not develop these lands. Access to the site would use the same primary access as originally approved. The project would continue to interconnect to the regional transmission grid currently under construction as Southern California Edison's Red Bluff Substation. The primary modifications to the approved project that have the potential to increase or add to the negative effects of the facility on cultural resources are:

- two, 250-MW plants or units each consisting of a 750-foot tall solar power tower and receiver, a power block, and a dedicated and interconnected field of approximately 85,000 heliostats on pedestals,

ENVIRONMENTAL SETTING

Paleoclimate and Paleoenvironment

Information on paleoclimate and paleoenvironment for the southern Mojave and northern Sonoran (Colorado) deserts are derived from plant macrofossils found in packrat middens (Grayson 1993, pp. 119–128; 139–143; 194–195; 199–202, 215; Spaulding 1990; Tausch et al. 2004; Thompson 1990; Wigand and Rhode 2002, pp. 332–342; Cole 1986; Van Devender 1990; West et al. 2007, pp. 32–33), and stratigraphic studies of playa and dry lake deposits years.

The Holocene, the geologic epoch that followed the ice age, or Pleistocene, and during which humans are known to have occupied North America, began approximately 12,000 years ago. For purposes of this discussion, the Holocene is divided into four periods: Early, Middle, Early-Late, and Late-Late.

Early Holocene (10,000-6000 BC)

During the Late Pleistocene and Early Holocene, as the climate became warmer and drier, extensive lowland conifer woodlands retreated upslope and were replaced by desert scrub associations. In the northern Sonoran Desert, around 9500 BC, hot desert plants (e.g., pigmy cedar, cat claw acacia) began dispersing into the region. From about 8,400 BC on, creosote bush begins to appear. This warmer, drier period, however, is

also noted for witnessing episodes of greater precipitation. In the Mojave Desert, three high lake-stands have been identified at Silver Lake playa, dating between 13,000 and 7300 BC (Ezzo et al. 1989). Gallegos et al. (1980, p. 93) postulate that two moister climatic intervals, dating between 10,500 and 9500 BC, occurred, based on a pair of caliche beds near Cadiz Dry Lake that were found to contain traces of human stonework.

Middle Holocene (6000-3500 BC)

The subsequent Middle Holocene was the warmest, driest part of the entire Holocene. Desert shrub vegetation dominated lowland and mid-level elevation localities. White burro bush and creosote bush increased in abundance. A dearth of vegetation data from the Middle Holocene suggests plant cover was probably very sparse as a consequence of severe drought conditions. Between approximately 4800 and 3000 BC, little evidence exists for summer rainfall. Gallegos et al. (1980, p. 93) postulate that a climatic interval, dating around 6500 to 6000 BC, probably resulted in lake filling based on the discovery of a site of that age, found in the fossil dunes near Bristol Dry Lake.

Early Late Holocene (3500 BC–AD 1)

The Early Late Holocene has been characterized as a period of relatively warm and dry conditions (sometimes drought) interspersed with evidence of cooler moister regimes. For example, evidence of peat deposits, dating to 3000 BC, have been found at various spring localities in the Mojave Desert. Similarly, around 1800 BC, a significant increase in the density of pinyon-juniper woodland took place in southern Nevada, suggesting cooler temperatures and winter-dominant precipitation. In the Mojave Desert, a high lake-stand at Silver Lake playa occurred approximately 1620 BC (Ezzo et al. 1989, 1992). Gallegos et al. (1980, p. 93) postulate that a climatic interval, about 1000 BC, probably resulted in lake filling again, based on evidence of shoreline camping at Cadiz Dry Lake.

Late Late Holocene (AD 1–present)

During the Late Late Holocene, temperature and precipitation patterns fluctuated significantly, swinging between periods of drought and relatively warm conditions (Meko et al. 2001; Stine 1994, 1996, 1998, 2000), with periods of summer-dominant precipitation and milder winters, contrasting with periods of cooler and somewhat drier conditions and increased winter-dominant precipitation, reminiscent of the previous epoch's ice age (Fagan 2000; Grove 1988; Meko et al. 2001; Scuderi 1987a, 1987b, 1990, 1993). Modern conditions have prevailed over the last 200 years, with increases in the distribution of pinyon pine, at the higher altitudes as well as expansion of saltbush and the creosote bush/white burro bush associations in the desert lowlands.

Gallegos et al. (1980, p. 93) postulate that a few hundred years ago, during the "Little Ice Age", rains would have maintained a marshy shallow lake in the Palen basin, supporting subsistence resources favorable for lakeshore hunting and gathering. This is based on hunting and processing tools, as well as red/buff pottery found in fossil dunes at the northwest end of the lake (Gallegos et al. 1980, p. 103). Large areas of residual sediments stand as "witness columns" and eroding plateaus, 1–2 meters higher than the present lakebed, indicating the former presence of an older lake. Rich

archaeological deposits, mixed with lag gravel, are exposed near the base of Palen's eroding dunes (Gallegos et al. 1980, p. 106).

Geology

The following discussion is primarily excerpted from Steinkamp (2009). The project site is located within the geomorphic province known as the Basin and Range, situated in the Chuckwalla Valley between the Chuckwalla Mountains to the south and the Palen and Coxcomb mountains to the north (Jennings 1967). The underlying geology consists of Quaternary alluvial, eolian, and lakebed deposits ranging from Pleistocene (1.8 million years old) to Holocene (8,000 BC to Recent) in age.

Portions of the Red Bluff substation and transmission line route are underlain by Quaternary intermediate alluvium, estimated to be 200,000 and 2,000 years old, consisting variously of gravel, sand, and silt, being situated on top of inactive, older alluvial fan surfaces (Stone and Pelka 1989). The bulk of the project area is comprised of Quaternary younger alluvium, locally dated as AD 1 to present (Stone and Pelka 1989), composed of silt, sand, and gravel derived from the surrounding mountains.

In contrast, the northeastern portion of the project site and temporary disturbance area is blanketed with surficial Quaternary lake bed deposits underlain by both eolian deposits and younger alluvium. These lake bed deposits are weakly consolidated to slightly dissected and in part overlain by modern playa deposits consisting of partly gypsiferous silt and clay (Jennings 1967; Stone and Pelka 1989). Active sand dunes and sand sheets of recent age also occur in the northeastern portion of the project area (Jennings 1967; Stone and Pelka 1989). The transition zone between lake bed and dune field is a mix of strongly deflated areas, interspersed with hummocky, linear, dome, and blowout dunes.

From southwest to northeast, the geomorphic landscape consists of a broad bajada (a coalescing of neighboring alluvial fans into a single apron of deposits) with parallel drainages of parallel rills, gullies, and washes that flow northeast toward a dune field in the northeast corner of the project area, bordering Palen Dry Lake bed.

Prehistoric Setting

During the 1970s, the Bureau of Land Management undertook a large-scale cultural resources inventory of the Central Mojave and Colorado Desert Regions (Gallegos et al. 1980). Crabtree (1980), in an overview of the region, subsequently summarized the history of archaeological study, identified the cultural chronology and common site types observed, and outlined the research topics of interest at that time. Subsequent cultural resources management investigations have contributed additional information to help refine our understanding of the prehistory of this region (Arnold et al. 2002, pp. 46–48; Love and Dahdul 2002; Schaefer 1994; Schaefer and Laylander 2007; Warren 1984, pp. 403–409).

An initial cultural chronology-culture history scheme for the Colorado Desert was developed in the 1930s and 1940s (Campbell 1931, 1936; Campbell and Campbell 1935; Campbell et al. 1937; Rogers 1939, 1945). This scheme has formed the foundation for subsequent efforts, most recently expressed by Sutton et al. (2007, pp.

233–243; table 15.4), relating the temporal periods and complexes delineated to those found in the Mojave Desert.

Paleo-Indian Period (about 13,000–8000 BC)

The Paleoindian Period occurred during the late Pleistocene and the first half of the Early Holocene. Early dates for New world and California settlement are found on the Channel Islands and feature a micro-blade technology that is thought to be similar to the ancient material cultures of Northeastern Asia and perhaps the islands of Japan (Erlandson 2012:28). Isolated fluted projectile points, assignable to the Western Clovis Tradition have been recovered from the Pinto Basin, McCoy Springs, Ocotillo Wells, Cuyamaca Pass, and the Yuha Desert (Dillon 2002, p. 113; Moratto 1984, p. 77, fig. 3.1; 87; Rondeau et al. 2007, pp. 64–65, fig. 5.1, table 5.1). All are surface finds, and have no associations with extinct fauna.

Lake Mojave Complex (8000–6000 BC)

The Lake Mojave complex, also known as the Western Pluvial Lakes/Western Stemmed Tradition (Beck and Jones 1997; Erlandson et al. 2007; papers in Graf and Schmitt 2007; Schaefer 1994, pp. 63–64; Sutton et al. 2007; papers in Willig et al. 1988), occurred during the second half of the Early Holocene. It is characterized by Great Basin Stemmed Series projectile points (Lake Mojave and Silver Lake types), abundant bifaces, steep-edged unifaces, crescents, and occasional cobble tools and ground stone tools. These artifacts often occur in undated surface contexts. Assemblage composition and site structure suggest highly mobile foragers, often traveling considerable distances. Little reliance upon vegetal resources is evidenced. The value of wetland habitats remains unclear. Lake Mojave life-ways may have resulted from relatively rapidly changing climate and habitats during the Early Holocene. This would have produced unpredictability in resource distribution and abundance, producing a high degree of residential mobility.

Deadman Lake Complex (7500–5200 BC)

Currently, the Deadman Lake complex appears confined to the Twentynine Palms area. Sites usually are surficial and located on old alluvial pediments. Artifacts include small-to-medium-size contracting stemmed or lozenge-shaped points, large concentrations of battered cobbles and core tools, and abundant bifaces, simple flake tools, and ground stone tools. The abundance of cobble tools suggests an emphasis upon plant processing. The Deadman Lake and Pinto complexes may represent two different human populations practicing different seasonal/annual rounds, or Deadman Lake may represent a component of the overall Pinto complex adaptation.

Pinto Complex (8000–3000 BC)

The Pinto complex spans portions of the Early and Middle Holocene. Toolstone use, based on sites attributed to this complex, focus upon materials other than obsidian and cryptocrystalline silicate (CCS). Pinto Series points are stemmed with indented bases, and display high levels of reworking. Bifacial and unifacial cores/tools are common. Ground stone tools are moderately to very abundant, indicating greatly increased use of plant resources. Pinto sites occur in a broad range of topographic and environmental settings, especially within remnant pluvial lake basins. Moderate to large numbers of

people, practicing a collector subsistence strategy, occupied large residential base camps for prolonged periods. Logistical forays into surrounding resource patches probably were made from these sites.

Possible Abandonment (3000–1000 BC)

Beginning roughly at this time, conditions in the Mojave Desert were warmer and drier. Few archaeological sites date to this period. This suggests population densities were very low. It is possible some areas were largely abandoned. This period corresponds in part to the latter part of the proposed "Altithermal Abandonment," recognized by some prehistorians as characterizing portions of the Great Basin (see Kelly 1997, pp. 8–9).

Gypsum Complex (1000 BC–AD 200)

The Gypsum complex, spanning most of the Early Late Holocene, is characterized by the presence of corner-notched Elko Series points, concave-base Humboldt Series points, and well-shouldered contracting-stemmed Gypsum Series points. Numerous bifaces also occur. Manos and metates are relatively common. During the early portion of the Gypsum complex, settlement-subsistence appears focused near streams. At this time, increased trade and social complexity apparently occurred. Gypsum components are smaller, more abundant, and occur over a more diverse suite of settings than those dating previously. Evidence for ritual activities includes quartz crystals, paint, split-twig animal figurines, and rock art. Gypsum sites are uncommon in the southern and eastern Mojave Desert.

Rose Spring Complex (AD 200–AD 1000)

Cultural systems profoundly changed in the southern California deserts during Late Late Holocene with the introduction of the bow and arrow, represented by Rosegate Series points. During this time, a major increase in population is thought to have occurred, possibly resulting from a more productive environment and a more efficient hunting technology. Sites often are located near springs, along washes, and sometimes along lakeshores. Intensive occupation is indicated by the presence of wickiups, pit houses, and other types of structures. Well-developed middens have yielded artifact assemblages containing knives, drills, pipes, bone awls, various ground stone tools, marine shell ornaments, and large amounts of obsidian. Obsidian procurement and processing apparently significantly structured settlement-subsistence.

During the middle of this period, a drought referred to as the Medieval Climatic Anomaly occurred, resulting in hypothesized resource shortages.

Late Prehistoric Period (AD 1000–AD 1700)

During the Late Prehistoric period, horticultural practices and pottery were introduced (most likely from the Hohokam area in southern Arizona or from northern Mexico), having its greatest impact along the Lower Colorado River (McGuire and Schiffer 1982; Schaefer 1994, pp. 65–74; Schaefer and Laylander 2007, pp. 253–254). Ceramic artifacts began to appear in the Colorado Desert approximately AD 1000, assigned to the Lowland Patayan (Lower Colorado Buff Ware) and Tizon Brown Ware traditions (Lyneis 1988; Waters 1982).

A complex cultural landscape composed of rock art, trails, and geoglyphs[4] developed during the Late Prehistoric period. Trade and exchange were elaborated, with an emphasis on links between coastal southern California and the Southwest. In addition to pottery, artifact assemblages include Desert Series projectile points, shell and steatite beads, and a variety of milling tools. Obsidian use declines significantly, with CCS becoming the dominant toolstone.

Prehistory of the Chuckwalla Valley

Singer (1984) presents a lithic quarry-oriented prehistoric settlement model for the Chuckwalla Valley and environs. Over 200 prehistoric sites occur in the region. Past peoples inhabiting the area appear to have been very mobile, especially during late prehistoric and early historic times. During early historic times, native peoples inhabited towns/hamlets located along the Colorado River, within the Coachella Valley, and at major desert springs/oases.

The Chuckwalla Valley was a resource exploitation zone. It served as an east-west oriented trade route/corridor between the Pacific Ocean and the Colorado River/greater Southwest and beyond. An extensive network of trails is present within the Chuckwalla Valley. Given its orientation and location, the valley may have been, at times, a neutral territory (i.e., a buffer zone), unclaimed by neighboring native peoples. At other times one or several tribes laid claim to all or portions of the Valley. Quarry sites probably were "owned" by tribal groups. The distribution of particular types of toolstones may have corresponded to a group's territorial boundaries, and a toolstone type may not have occurred beyond the limits of a group's specific territory.

Within the Chuckwalla Valley, prehistoric sites are clustered around springs, wells, and other obvious important features/resources. Sites include villages with cemeteries, occupation sites with and without pottery, large and small concentrations of ceramic sherds and flaked stone tools, rock art sites, rock shelters with perishable items, rock rings/stone circles, geoglyphs, and cleared areas, a vast network of trails, markers and shrines, and quarry sites. Possible village locations are present at Palen Lake, Granite Well, and Hayfield Canyon.

A cluster of temporary habitation and special activity (task) sites occurs around a quarry workshop in the Chuckwalla Valley. The Chuckwalla Valley aplite quarry workshop complex probably was used throughout the Holocene. During this period, Chuckwalla Valley most likely was occupied, abandoned, and reoccupied by a succession of ethnic groups. In the Early Holocene (i.e., Lake Mohave complex times), the area may have been relatively densely inhabited. During the Middle Holocene (i.e., Pinto and Gypsum complexes period) it may only have been sporadically visited. The subsequent Late Holocene Rose Spring and Late Prehistoric periods probably witnessed reoccupation of the valley by Yuman and Numic-speaking peoples.

[4] Geoglyphs, also known as intaglios, were created on desert pavements by rearranging and/or clearing pebbles and rocks to form alignments, clearings, and/or figures. Rock alignments are present throughout this region, while representational figures only occur close to the Lower Colorado River. It is assumed that they played some role in sacred or ritual activities for prehistoric Native Americans.

Research Topics

The research topics discussed below include toolstone procurement, ceramic traditions, horticulture, trade and exchange, and cultural landscapes.

Toolstone Procurement

The geology of the Colorado Desert provided prehistoric peoples with a variety of lithic materials for artifact production (Schaefer and Laylander 2007, pp. 252–253). These included obsidian, cryptocrystalline silicates (chert), crystalline volcanics (basalt, rhyolite), quartz, and plutonic, metamorphic, and sedimentary rocks.

Coso obsidian was the dominant source of obsidian used by Colorado Desert peoples prior to AD 1000. Other obsidian sources, from the southern Mojave Desert, include Bristol Mountains and Devil Peak (Shackley 1994). Approximately a dozen sources located in Baja California, extreme northwest Sonora, and western Arizona may also have been used (Shackley 1988, 1995, 2005). During the last thousand years, however, Obsidian Butte was the principal obsidian used in the Colorado Desert and coastal southern California (Hughes 1986; Hughes and True 1983; Laylander and Christenson 1988; Schaefer and Laylander 2007, p. 251). Obsidian Butte, located near the southern edge of the Salton Sea, was inaccessible when Lake Cahuilla rose to inundate it (130 feet above sea level).

Several topics relating to prehistoric quarrying and tool manufacturing/use have been identified, including: distinction between formal versus the expedient procurement of toolstone (Wilke and Schroth 1989); lithic reduction strategies and transport of toolstone (Bamforth 1990, 1992); scales of production at ground stone tool quarries (Schneider et al. 1995); and differences in tools/toolstones by gender (Walsh 2000).

Bamforth (1990, 1992) considers Holocene settlement, raw material, and lithic procurement at several quarry sites in the central Mojave Desert. He suggests that quarry use was conditioned upon mobility strategies, regional quality and abundance of toolstone, as well as quarry location. Bamforth suggests that an emphasis on transporting prepared cores during the period 2000 BC–AD 500 may have resulted from the formation of relatively large and stable communities in areas with concentrated plant resources.

Singer (1984) studied two quarry workshop sites located in Chuckwalla Valley. Core production and reduction from locally available aplite was emphasized. This yielded flakes and bifaces, which appear to have been exported from the quarries for final reduction at other sites. Few formed tools were observed. Those that were present were choppers and scrapers, possibly used to manufacture wooden digging or prying sticks and shafts. The quarry sites appeared to have experienced long-term occupation and use.

Manufacturing efforts appear to have been directed towards production of expedient, rapidly discarded cutting/scraping/pounding/milling tools from locally available toolstone(s) (Ludwig 2005; Schaefer and Laylander 2007, pp. 252–252; Singer 1984). Specialized tool manufacturing included production of sandstone metates along the western side of the Colorado Desert, projectile point (arrow) workshops at seasonal task

sites situated around playas, and large quarries at volcanic outcrops within the Lower Colorado and Gila River Valleys, where mortars and pestles were made (Schaefer and Laylander 2007, p. 252).

Ceramic Traditions

Schaefer and Laylander (2007, pp. 252–253) note that buffware pottery occurring within the Colorado Desert was initially assigned to the Hakataya ceramic series (Schroeder 1958, 1979). Subsequent studies (Waters 1982) place it within the Lowland Patayan Ceramic Tradition. Both typologies are based on surface collections of sherds, with little data resulting from stratigraphic excavations, or associated radiocarbon dates. Schroeder focuses upon details of temper, inclusions, and surface treatment, while Waters emphasize rim form. Both attempt to define geographic limits of production for each type. Difficulties in applying either typology, and problems with stratigraphic integrity, archaeological contexts, and anomalous associated radiocarbon dates, have allowed only gross chronological estimates and have limited identification of manufacturing regions.

In the Salton Basin, some sites dating between about AD 350 and AD 1200 contain pottery (Love and Dahdul 2002). This evidence suggests pottery was not introduced or rarely used prior to about 1000 AD. Earlier dates from the preceding 200 years suggest Lake Cahuilla may have attracted Colorado River peoples (and their pottery). Early ceramic dates from the Colorado Desert correspond closely with the inception of widespread use of Tizon Brownware pottery in the Peninsular Ranges and along the Pacific Coast (Lyneis 1988; Griset 1986), although some dates suggest initial introduction of ceramics by AD 800, if not before.

Viewed regionally, pottery use within the Late Prehistoric of the Colorado Desert can be divided into three periods (Arnold et al. 2002, pp. 46–47; Love and Dahdul 2002, pp. 72–73; Waters 1982). Patayan I times, about AD 800–AD 1050, witnessed the inception of several ceramic traditions. During Patayan II times, AD 1050–AD 1500, increased local manufacture and use of pottery occurred. Patayan III, AD 1500–AD 1760, saw the introduction of “Colorado Buff” pottery, and the westerly spread of ceramics to coastal southern California.

With respect to social and cultural factors governing pottery adoption and use within the Colorado Desert, recent analyses of pottery from the Mojave Desert and surrounding areas provide models focused on behavioral implications regarding its manufacture and function. One concern has been with determining if ceramic vessels were locally made (Eerkens 2001; Eerkens et al. 1999, 2002a; Griset 1986). Neutron activation analysis and petrographic studies have been used to identify chemical and material signatures (Eerkens et al. 2002b). Pottery manufacture does not appear to have been organized at a higher regional level. Instead, pots generally appear to have been locally produced and used, with limited exchange of pots between different groups. Production appears to have been organized at an individual or family level, emphasizing production of largely utilitarian wares.

Pottery from sites in the northern Mojave is characterized by a relatively high number of elemental signatures suggesting higher levels of mobility (Eerkens et al. 2002b). In addition to a higher degree of residential mobility, Eerkens (2003a) suggests people

inhabiting the northern Mojave Desert produced a fairly large number of pots. The combination of high mobility and a fairly high level of pottery production are seen as leading to caching pots near lowland wetlands, which were fixed in the landscape, development of pottery attributes promoting fuel consumption, and a high degree of standardization of largely utilitarian ceramics.

Sedentism in the Owens Valley, northeast of the project area, appears to have developed concurrently with, or immediately prior to, an emphasis on resource storage approximately 500 AD. Small seed intensification appears to have occurred about AD 1300–AD 1400, at the time brownware pottery became widely used. Eerkens concludes that social models, such as those suggesting the activities of aggrandizers or the stabilization of long-distance exchange networks, do not explain these developments. The role played by decrease(s) in population-to-resource balance(s), resulting from increased population pressure, remains unclear.

Eerkens (2003b; 2004) suggests the significant increase in small seed use and the advent of brownware pottery around AD 1300–AD 1400 are linked. People focused upon seeds because they could easily be privatized. That is, they could be individually owned and thus would not be subject to unrestricted sharing. Pots were a critical component of small seed intensification, because they generally were individually made and owned and could be used within houses, allowing food preparation and consumption to occur in private. Privatization of small seeds may have resulted from increased population size yielding more potential "freeloaders," new community kinship structures, and the creation of resource surplus.

Horticulture

At the time of initial Euroamerican contact, 240 years ago, native peoples living along the Lower Colorado River and the Colorado Delta were growing a wide variety of domesticates and wild grasses, which provided 30–50 percent of their subsistence economy (Bean and Lawton 1967; Castetter and Bell 1951; Schaefer and Laylander 2007, pp. 253–254). Annual flooding of the floodplains along the Colorado rejuvenated the soil and provided enough moisture to sustain crops. Lower Colorado River agriculture is presumed to have begun around 700 AD. It probably spread either from the Hokokam area (to the east), or from northern Mexico (to the southeast) (McGuire and Schiffer 1982).

Horticulture subsequently appears to have spread west from the Colorado River. Desert Tipai peoples practiced floodplain agriculture along the New and Alamo Rivers. They also constructed small dams and ditches along washes to direct irrigation water onto adjacent terraces. Agricultural elements probably reached the Imperial Valley around AD 1700. Seed caches and mythological references to cultigens possibly indicate very late prehistoric adoption of agriculture. However, the caches contained both native and Old World cultigens. Thus it is unclear if agriculture penetrated west of the Peninsular Ranges in southern California before Euroamerican contact and the sustained influence that came with the establishment of Spanish missions.

Native cultigens may have reached the western Colorado Desert through trade instead of by local production (Schaefer and Laylander 2007, p. 254). Within the Colorado Desert, several archaeological sites have ceramic jars or rock-lined cache pits

containing food remains of native or Old World plants (cf., Bayman et al. 1996; Swenson 1984; Wilke 1978; Wilke and McDonald 1989; Wilke et al. 1977). Pumpkin seeds occur in human coprolites (fossilized feces) from the Myoma Dunes at the north end of Lake Cahuilla, and also in a ceramic jar from the west shore of Lake Cahuilla, north of the Fish Creek Mountains. The latter dated to AD 1420–1660 (Wilke 1978; Wilke et al. 1977).

Early-to mid-nineteenth-century Cahuilla archaeological sites contain glass beads, flaked glass, domestic animal bones, carbonized maize and tepary beans, and uncarbonized gourds. Abundant evidence exists indicating the Cahuilla practiced irrigated agriculture during the early- and mid-nineteenth century. The paucity of macro- and micro-fossil cultigen remains from prehistoric archaeological deposits in Cahuilla territory strongly suggests agriculture did not play a significant role in the Cahuilla economy until the early nineteenth century. Early historic intensification of agriculture may have resulted from final desiccation of Lake Cahuilla, regional population growth, decreased mobility, and acculturation, including introduction of Euroamerican irrigation techniques.

In the Mojave Desert and environs, in the approximate period from AD 1–1200, agriculture first was practiced in southern Nevada and environs as a consequence of the Anasazi Intrusion (Warren 1984, p. 421, fig. 8.25). Maize, squash, beans, grain amaranth, and sunflowers were grown. Agriculture was practiced along with foraging for wild plants and animals. Fields probably were irrigated in some manner. Agriculture appears to have intensified over time.

Yohe (1997) notes aboriginal cultigens, such as melons, squash, and beans, were present at two rock shelters dating to the late nineteenth or early twentieth century in Death Valley. Fowler (1995, pp. 110–112; 1996, pp. 91–98) details garden horticulture among the Southern Paiute and Panamint and Timbisha Shoshone. Stream-irrigated gardens were cultivated, in which corn, beans, squash, sunflowers, and amaranth were grown. These groups also planted gardens near springs, had communal fields with irrigation ditches, and unirrigated stream-bank garden plots. Various land management practices were employed, including intentional burning, clearing, pruning, and coppicing, transplanting and cultivation, and cleaning of water sources.

Winter and Hogan (1986, pp. 125–127, table 1) note that during protohistoric times, agriculture was practiced by the southern California/Nevada Chemehuevi and Ash Meadows, Pahrump, Las Vegas, and Moapa Southern Paiute bands. Among the crops grown were corn, beans, squash, and sunflowers. Forms of plant husbandry directed towards non-domesticates included burning to encourage growth of new plants, broadcast seed sowing, and irrigation of wild stands of bulb and seed plants (Winter and Hogan 1986, pp. 128–129, table 2). These practices are thought to have begun prehistorically, continuing and possibly expanding during early historic times.

Trade and Exchange

As Schaefer and Laylander (2007, pp. 254–256) note, prehistoric and ethnohistoric Colorado Desert peoples had a highly developed network of connections linking locations within and beyond the region. High mobility produced considerable cross-cultural interaction and integration in spite of frequent open aggression and warfare

between different groups. This integration and interaction occurred between mobile hunter-gatherers and sedentary horticultural peoples. They are archaeologically manifested by the spatial distribution of site types, rock art, artifacts (especially ceramics and shell ornaments), and toolstones (especially obsidian).

Archaeologists monitor the dynamics of prehistoric trade in the Colorado Desert by analysis of the distributions of artifacts made from various toolstones, shell beads and ornaments, and ceramic types and composition (Schaefer and Laylander 2007, pp. 255–256). As previously stated, with respect to toolstones, obsidian from Obsidian Butte is fairly commonly represented in sites located within montane and coastal southern California (Hughes 1986; Hughes and True 1983; Laylander and Christensen 1988). Obsidian from sources in northern Baja California may have been routed via the Colorado Desert to coastal southern California sites (McFarland 2000). Wonderstone from the Rainbow Rock source is present in western San Diego County and the northern Coachella Valley (Bean et al. 1995; Pigniolo 1995). Material for steatite artifacts found in Colorado Desert sites probably comes from sources in the Peninsular Ranges. Material for argillite artifacts may be from a central Arizona source.

Artifacts made from shellfish species inhabiting the northern Sea of Cortez occur in coastal southern California and the Great Basin (Bennyhoff and Hughes 1987; Fitzgerald et al. 2005) and may have been traded through the Colorado Desert (Schaefer and Laylander 2007, p. 255). Shells from southern California coastal species have been found at a number of Colorado Desert sites and those in the Southwest (Ford 1983). These artifacts may have resulted from direct procurement of shells, or exchange. At the Elmore site, associated with the protohistoric recession of Lake Cahuilla, shell debitage indicates local manufacture of shell beads and ornaments (Rosen 1995). In the Coachella Valley, shell artifacts may reflect close ties to peoples living along the Santa Barbara Channel.

A cache of Lower Colorado Buffware (i.e., Patayan) anthropomorphic figures found in an Orange County site indicates interregional connections (Koerper and Hedges 1996). These also are suggested by the frequency of Lower Colorado Buffware (i.e., Patayan/Hakataya) pottery throughout the Colorado Desert (Bean et al. 1995; Cordell 1997; McGuire 1982; Schaefer and Laylander 2007, p. 255; Schroeder 1979; Shaul and Hill 1998; Waters 1982). However, its use occurred among a number of prehistoric peoples practicing divergent settlement and subsistence patterns. Consequently little effort has been made to refine or apply the Patayan tradition as an integrative model.

On a local level, Plymale-Schneeberger (1993) examined pottery from three sites in Riverside County. Petrographic and geochemical analyses allowed quantitative distinction between Tizon Brown Ware and Lower Colorado Buff Ware. The study concluded that Brown Ware was locally produced while Buff Ware was imported. Seymour and Warren (2004) examined proportions of Tizon Brown Ware and Lower Colorado Buff Ware present at sites in Joshua Tree National Park and noted correspondence of pottery types with approximate boundaries of territories occupied by ethnohistorically known native peoples (that is, Cahuilla, Serrano, Chemehuevi).

Davis (1961) and Sample (1950) note that a considerable degree of historic-period trade between Native Americans occurred within and across the Colorado Desert.

Trade networks across the Colorado Desert extended to the Yokuts and Chumash. Native peoples living along the Colorado River received and reciprocated goods from many groups living to the west.

Cultural Landscapes

In the Colorado Desert, trails, cairns, geoglyphs, cleared circles, rock rings, other desert pavement features, rock art sites, and artifact scatters appear to be elements of prehistoric-ethnohistoric cultural landscapes[5] (Schaefer and Laylander 2007, pp. 254–255; Cleland and Apple 2003). Specific localities include the McCoy Springs Complex, Chuckwalla Springs, Corn Springs, Red Cloud area, and Dragon Wash. Numerous isolated petroglyphs are located throughout the Valley. Lower Colorado River geoglyph and rock art sites may represent prehistoric ceremonial centers, located along a route extending between sacred places, representing the cosmology and iconography of Yuman peoples (Altschul and Ezzo 1995; Cleland 2005; Ezzo and Altschul 1993; Gregory 2005; Hedges 2005; Johnson 1985, 2003; Woods et al. 1986).

Trails

During late prehistoric and ethnohistoric times, an extensive network of Native American trails was present in the Colorado Desert and environs (Heizer 1978; Bean et al. 1978: 5-1; Cleland 2007; Sample 1950: 23; Apple 2005; Earle 2005; Melmed and Apple 2009; Von Werlhof 1986). Segments of many trails are still visible, connecting various important natural and cultural elements of landscape. For example, these trails are often marked by votive stone piles/cairns and/or ceramic sherd scatters.

A late prehistoric to early historic Native American trail has been reported traversing roughly east to west through the Chuckwalla Valley (Johnston and Johnston 1957, map 1). Johnston (1980, pp. 89–93, fig. 1) identifies this route as part of the Halchidhoma Trail (recorded as CA-RIV-53T), which runs from San Bernardino through San Gorgonio Pass to the Colorado River at present day Palo Verde Valley. In the vicinity of the Chuckwalla Valley, the trail proceeded roughly east to northeast from Hayfield Dry Lake past the future community of Desert Center, then eastward, south of Palen Dry Lake towards Ford Dry Lake, and then on to the Colorado River[6]. The trail's name, variously, the Halchidoma or Coco-Maricopa Trail, refers exclusively to the control and use of this particular linear route from approximately 1700 to 1825. This route was incorporated into other trail networks before and after this period which were routinely subject to shifts in control and use. The Halchidhoma Trail may run directly through the PSEGS facility site. Another trail segment, CA-RIV-893T, oriented roughly north to south, is just south of the proposed facility site.

[5] Cultural landscapes, when related to specific ethnic groups, are referred to as Ethnographic Landscapes (Hardesty 2000).

[6] A more direct trail route went southeast from Hayfield Dry Lake via Aztec Well/Corn Spring and south from Ford Lake, rejoining the northern route at the south end of the McCoy Mountains.

Geoglyphs

Geoglyphs were constructed on desert pavements by rearranging and/or clearing pebbles and rocks to form alignments, clearings, and/or figures (Arnold et al. 2002; Gilreath 2007, pp. 288–289; Solari and Johnson 1982). These constructions (Harner 1953) occur throughout the deserts of southeast California and adjacent portions of southern Nevada and western Arizona. Rock alignments are present throughout this region, while representational figures only occur close to the Lower Colorado River.

Colorado River geoglyphs include the Topock Maze (Rogers 1939) and a few dozen giant ground figures (Harner 1953; Setzler and Marshall 1952), often first observed from the air. During historic times, the Topock Maze was used by Yuman peoples for spiritual cleansing.

Johnson (1985, 2003), von Werlhof (2004), and Whitley (2000) relate the geoglyphs to Yuman cosmology, origin myths, and religion. Cation-ratio dating[7] of desert varnish has provided estimated ages of approximately AD 800–1000 for the Colorado geoglyphs (Dorn et al. 1992; Schaefer 1994, p. 63; von Werlhof 1995), although use of the technique remains controversial (Gilreath 2007, p. 289).

Von Werlhof (1995, 2004) relates these sites to the Yuman creation story. They also may have functioned as focal points for shamanistic activities, vision quests, curing, and group rituals/ceremonies. Symbolic activities also were represented by intentional pot-drop distributions along trails near water sources. The importance to Native Americans of water sources for survival during long-distance trips and seasonal rounds is obvious. Water sources also manifested significant spiritual values and often were associated with major rock art complexes (McCarthy 1993; Schaefer 1992).

Ethnographic Background

Ethnography fulfills a supporting role for other anthropological disciplines as well as contributing on its own merits. Ethnography provides a supporting role to the discipline of archaeology by providing a cultural and historic context for understanding the people that are associated with the material remains of the past. By understanding the cultural milieu in which archaeological sites and artifacts were and still are remanufactured, utilized, or cherished, this additional information provides greater understanding for identification efforts, making significance determinations per the National Historic Preservation Act (NHPA) or CEQA; eligibility determinations for the National Register of Historic Places (NRHP) or the CRHR; and for assessing if and how artifacts are subject to other cultural resource laws, such as the Native American Graves Protection and Repatriation Act (NAGPRA) and the Archaeological Resources Protection Act (ARPA).

In addition, ethnography has merits of its own by providing information concerning ethnographic resources that encompass physical sites, places, areas, or elements of a site, place or area. Historic property types with overlap and affinity with ethnographic

[7] Cation ratios between weathered rock varnish and unweathered rock are used as a relative dating technique to roughly determine the age of prehistoric rock carvings (petroglyphs). The quantity of positively-charged ions within the varnish (a chemically-changed layer built up of calcium and potassium leachate over time) is compared to those within the unweathered rock beneath the varnish.

resources are referred to as cultural landscapes, traditional cultural properties, Sacred Sites, and heritage resources, or historical resources that are areas, places, or sites. There is notable overlap in terminology when referring to ethnographic resources. Studies that focus on specific ethnographic resource types also take on names such as ethno-geography, ethno-botany, ethno-zoology, ethno-semantics, ethno-musicology, etc. In general, the ethnographic endeavor attempts to minimize human conflict by facilitating iterative cross cultural understandings and, by extension, self-awareness and informed consideration of others. An ethnographic analysis was conducted for the originally licensed PSPP project, and staff used this analysis to inform the current analysis for the amendment to the project. Staff conducted an ethnographic study to identify Native American concerns and utilize as a basis for determining the significance of related resources and potential mitigation for impacts to those resources that may have their integrity impacted due to the change in the visual nature of the PSEGS project.

Tribes were invited to participate in the ethnographic study, based upon a list of 16 affiliated tribes, organizations, and individuals provided by the Native American Heritage Commission and the Bureau of Land Management (BLM). The 16 invited entities represent nine different cultural affiliations. From north to south, these affiliations are: Chemehuevi (Southern Paiute), Mohave[8], Serrano, Cahuilla, Cupeño, Luiseño, Kumeyaay, Quechan, and Cocopah Of the 16 entities, 7 are participating in consultation for the project and/or this study **Cultural Resources Figure 2** provides locational information for each of the tribes affiliated with the project area.

Southern Paiute

The Southern Paiute are an Indian population that resided within an expansive portion of the Great Basin. Their territory formed a crescent extending northwest from the vicinity of present-day Blythe, California along the Colorado River to the Amargosa Range. From the Amargosa Range, Southern Paiute territory extended northeast into southern Nevada, between the White River and Virgin River watersheds. The northern edge of Southern Paiute territory reached the southwestern part of present-day Utah. This group also held land in northern Arizona, north of and including the northern band of the Colorado River. The eastern boundary was marked by the southeastern flank of the Rocky Mountains, just east of the Colorado-San Juan River confluence. The Chemehuevi are the only subgroup of Southern Paiute that resided in the project vicinity, along the lower Colorado River between Needles and Blythe (Kelly and Fowler 1986: Figure 1). Today there are several groups of Chemehuevi, those who live at the Chemehuevi Indian Reservation near Parker, those who live at the Colorado River Indian Reservation, and those who reside at the reservations of the Twenty-Nine Palms Band of Mission Indians, Augustine Band of Mission Indians, and Torres Martinez Mission Band of Indians.

[8]'Mojave' is routinely spelled with a 'j' when referencing the "Mojave" desert. In addition the Fort Mojave Tribe also retains the 'j' spelling. However, the Mohave contingency of the Colorado River Indian Tribes (CRIT) prefer to spell 'Mohave' with an 'h.'

Chemehuevi Indian Tribe

The Chemehuevi Tribe is a federally recognized tribe and the official name is the Chemehuevi Indian Tribe of the Chemehuevi Indian Reservation (BIA 2012: 133). Rather than remain on the Fort Mojave Reservation near Needles, California where they had been forced to live with some of the Mojave, the Chemehuevi requested that the federal government establish their home in their traditional area, the Chemehuevi Valley. They remained there and at Beaver Lake and Cottonwood Island until dam construction forced them out in 1929. The Chemehuevi Reservation was founded on the Colorado River in Chemehuevi Valley north of Parker, Arizona (Kelly and Fowler 1986: 388-389).

In 1935, Congress authorized the Metropolitan Water District to obtain as much reservation land as needed to create Parker Dam, which ultimately caused the inundation of 8,000 acres of tribal lands in 1940. In the 1960s, some Chemehuevi members from the Colorado River Indian Reservation joined with off-reservation tribal members in reorganizing the Chemehuevi Tribe and reactivating the Chemehuevi Reservation. The date of election of the Chemehuevi Indian Tribe's constitution was February 14, 1970 (Rusco and Rusco 1978: 565, Table 1).

The current reservation encompasses 32,000 acres of trust land with 30 miles of Colorado River frontage (Chemehuevi Indian Tribe 2013a). The tribe is based in Havasu Lake, California (BIA 2012: 123). An Executive Committee comprising a chairperson, vice chairpersons, and secretary treasurer oversees daily tribal operations and enterprises. The tribe also has a nine-person tribal council and a tribal court (active since 1996). The tribe's Cultural Center seeks to educate its younger generations about contemporary and traditional Chemehuevi life. The tribe operates the Havasu Landing Resort & Casino (Chemehuevi Indian Tribe 2013b, 2013c, 2013d, 2013e).

Twenty-Nine Palms Band of Mission Indians

The Twenty-Nine Palms Band of Mission Indians reservation has two pieces: one south of the Oasis of Mara in the city of Twentynine Palms, and one adjacent to the Cabazon Reservation in Indio (TNPBMI 2013a). The Oasis of Mara was a Serrano residence as early as 1852, although groups were undoubtedly living at the oasis prior to the mid-nineteenth century. The Chemehuevi moved to the oasis after a war with the Mohave on the Colorado River in 1867. The water from the oasis provided sufficient water for horticulture, and hunting and gathering around the oasis was productive until the late 19th century when Euro-Americans settled in the area and began depleting the resources upon which the Chemehuevi were dependent. Eventually, the families who lived there, the Ramirez, Pine and Mike families spent part of their time following their traditional patterns, and the other working wage labor jobs in the Coachella Valley. The Chemehuevi received a patent in 1895 for a reservation near the oasis, but the 160 acre reservation was located southwest of the oasis in an area with no surface water and no Native Americans established any residences. Most of those Chemehuevi who lived in the Twentynine Palms area in 1908 moved to the Morongo Reservation in Banning when Indian children were forced to attend the St. Boniface Indian School in Banning. The Twenty-Nine Palms band retained an identity separate from those Chemehuevi at the reservation on the Colorado River and on other reservations in the Coachella Valley, but in 1910 they were encouraged to live at the Cabazon Reservation in Indio. Conflict

between the Cahuilla and Chemehuevi at Cabazon led most of them to leave. They either moved to the Twenty-Nine Palms reservation, with the Paiutes in Nevada, the Chemehuevi near Parker, the Luiseno and Cahuilla at Soboba reservation, the Agua Caliente Reservation or one of the other reservations in California. In the 1970s a 240 acre parcel of the Cabazon Reservation was allotted to the Twenty-Nine Palms band.

Currently, the reservation maintains a total of 400 acres, 160 acres in Twentynine Palms and 240 acres in Indio (TNPBMI 2013a). The tribe is based in Coachella, California (BIA 2012:110). The Tribal Council consists of all adults 18 years of age or older, and among the Tribal Council; a chairperson and secretary/treasurer is elected. The tribe employs a Tribal Historic Preservation Officer who administers the tribe's cultural and heritage programs. The tribe also maintains the Spotlight 29 Casino in Coachella, and will be opening the Tortoise Rock Casino in Twentynine Palms in the fall of 2013 (TNPBMI 2013a, 2013b, 2013c).

Mohave

Currently, the Mohave Indians are members of one of two tribes, 1) former residents of the Fort Mojave Reservation in Arizona, now residing in Needles, and 2) Mohave of the Colorado River Reservation, part of the Colorado River Indian Tribes (Stewart 1983a: 55).

Colorado River Indian Tribes

The Colorado River Indian Tribes of the Colorado River Indian Reservation is a federally recognized tribe, headquartered in Parker, Arizona and members of the Mohave, Chemehuevi, Hopi, and Navajo Tribes live here (BIA 2012:123; CRIR 2009a). The Colorado River Reservation was originally established in 1865 for the Mohave. Additional land was added in 1874 to settle Chemehuevi Indians on the reservation (Kelly and Fowler 1986: 388-389; Stewart 1983a: 55). Hopi and Navajo were later settled on the reservation as well (CRIR 2009a).

The Colorado River Reservation encompasses 300,000 acres on the Colorado River. The mainstay of the Colorado River Indian Tribes' economy has historically been agriculture and the tribe grew cotton, sorghum, and alfalfa. The Colorado River Indian Tribes run businesses in sand and gravel quarrying, real estate development and retail. Additionally, they operate the Blue Water Resort and Casino in Parker (CRIR 2009a). The tribal government is administered by a nine-person Tribal Council, which consists of a chairperson, vice chairperson, treasurer, secretary, and five council members (CRIR 2009b).

Fort Mojave Indian Tribe

The Fort Mojave Indian Tribe of Arizona, California, and Nevada is a federally recognized tribe with its governmental seat in Needles, California (BIA 2012: 123). The Fort Mojave Reservation covers almost 42,000 acres in Arizona, California, and Nevada. The land is divided into three major segments: 23,669 acres in Mojave County, Arizona; 12,633 acres in San Bernardino County, California; and 5,582 acres in Clark County, Nevada (Fort Mojave Indian Tribe n.d.).

The Fort Mojave tribal government consists of a chairperson, vice-chairperson, secretary, and four council members. The tribe operates the Avi Resort and Casino, which contains a casino, hotel, restaurants, and a movie theater. The tribe also hosts an annual Pow Wow every February (Fort Mojave Indian Tribe n.d.).

Quechan

Quechan Tribe of the Fort Yuma Indian Reservation (Quechan Tribe)

The Quechan Tribe is a federally recognized tribe with its governmental office in Yuma, Arizona (BIA 2012: 125). The U.S. government established the Fort Yuma-Quechan Reservation on the California side of the Colorado River in 1884, although much of the land was appropriated by Euro-Americans settlers. Reservation lands were further broken up by allotment to individual Quechan members in 1912. The tribe ratified a constitution and elected a seven-person tribal council in 1936. In 1978, the tribe had 25,000 acres of land restored to them (Bee 1983: 94-96). Today, the Quechan Tribe's reservation spans the Arizona-California border at the Colorado River near the confluence with the Gila River, and encompasses 45,000 acres of land.

The tribal government is headed by a president and vice president, as well as five council members. Business enterprises include a 700 acre agricultural lease to a non-tribal farmer and a sand-and-gravel lease to a private company. The tribe also manages trailer and RV parks, a museum, a casino, a utility company, and a fish and game department (Inter-Tribal Council of Arizona 2011). The tribe employs a Tribal Historic Preservation Officer and maintains the Quechan Cultural Committee.

Cocopah

Cocopah Indian Tribe

The Cocopah Indian Tribe is a federally recognized tribe with its seat in Somerton, Arizona (BIA 2012:125). The Cocopah originally resided north of their historically documented territory and are believed to have been displaced by the Mohave and Quechan ca. A.D. 1400-1500 (Williams 1983:99-100).

Today there are two branches of Cocopah, one in the United States ("American Cocopah") and one in Mexico ("Mexican Cocopah"). This division resulted from the actions of the United States and Mexican governments concerning Indians residing within the boundaries of these two dominant nations. For instance, in 1917, the United States gave the "American Cocopah" title to three small land areas under the jurisdiction of the Yuma agency (Williams 1983:102). Increased border enforcement in 1930 exacerbated the separation of the two groups (Kelly 1977: 13).

The Cocopah in Arizona began to organize in 1961, beginning with a revision of the tribal constitution and bringing electricity to tribal lands. The Cocopah have three reservations: Cocopah West Reservation, Cocopah East Reservation, and Cocopah Lots 5 and 6. These lands total 1,800 acres (Williams 1983:102). In 1964, the Cocopah Indian Tribe formed its first constitution and a five-person tribal council. In 1985, the Cocopah obtained an additional 4,200 acres of reservation land, including the North Reservation, via the Cocopah Land Acquisition Bill. The tribe is currently led by a chairperson, vice chairperson, and three council members (Cocopah Indian Tribe n.d.).

A Tribal Historic Preservation Officer is employed by the tribe to facilitate cultural resource issues for them.

Cahuilla

Cahuilla leaders Juan Antonio and Cabeson, among others, acted as negotiators for the treaties between the Cahuilla and the U.S. Government in 1851. Reservations were established for the Cahuilla in 1875 and they were able to maintain their traditional patterns in combination with wage labor until about 1891, when federal supervision of the 10 Cahuilla reservations increased. This supervision included enrollment in government schools and cultural suppression of traditional Cahuilla lifeways (Bean 1978:584, Table 3). Today, Cahuilla reside on eight different reservations in and around the San Jacinto Mountains and Coachella Valley.

Agua Caliente Band of Cahuilla Indians

The federally recognized Agua Caliente Band of Cahuilla Indians was granted land at Tahquitz Canyon, Riverside County, in 1876 (ACBCI 2013a; Bean et al. 1978: 5-14, 5-16). From 1891 until the 1930s, Indian Service (Bureau of Indian Affairs) personnel lived on-reservation and closely controlled tribal politics. The Indian Reorganization Act of 1934 gave more political autonomy to the Cahuilla, permitting, among other rights, the authority to reestablish tribal governments (Bean 1978: 584; Castillo 1978: 121).

Currently, the tribe is based out of Palm Springs, California, and its members constitute the largest single landowner in Palm Springs (BIA 2012: 106). The Agua Caliente Band is governed by a tribal council consisting of a chairperson, vice-chairperson, secretary/treasurer, and two council members. The council members are elected by the tribe, and elected members appoint four proxy members (ACBCI 2013b). The tribe maintains a cultural resources department directed by a Tribal Historic Preservation Officer. The tribe has numerous business ventures including the Agua Caliente Casino, Resort and Spa in Rancho Mirage; the Spa Resort Casino in Palm Springs; a golf resort, and real estate (ACBCI 2013a).

Augustine Band of Cahuilla Indians

The Augustine Tribe and their Reservation are both named after Captain Vee-Vee Augustine, a Cahuilla leader born in 1820. There were at least 22 village sites noted by early explorers in the Coachella Valley, one of which ended up being the Augustine Reservation. The Reservation was established by Congress in 1891 at the *Temal Wakhish* village site near Thermal, California. In 1972 there was only one last surviving member of the tribe, Roberta Augustine the great-granddaughter of Captain Augustine. Roberta had three children who, along with their descendants, constitute the official tribal membership today.

This federally recognized tribe is based out of Coachella, California, and is governed by a tribally elected chairperson (BIA 2012: 106). Economic ventures for the tribe include the Augustine Casino, and the Augustine Solar Energy Park, a 1.1 MW solar photovoltaic (PV) plant at the Augustine Solar Energy Park built on reservation land (ABCI 2010a, 2010b, 2010c).

Cabazon Band of Mission Indians

The Cabazon Reservation was established in 1876 and is a federally recognized tribe based in Indio, California (BIA 2012:105). The primary economic resource on the 1,153-acre reservation is agriculture. As Mission Indians, the Cabazon Reservation associates and interacts closely with the network of other reservations of Mission Indians in the region (Bean 1978: 584-585, Table 3).

The tribal government of the Cabazon Band of Mission Indians consists of five tribally elected officials; a chairperson, a vice chairperson, a secretary/treasurer, a liaison/general counsel, and a member at large. Elections are held every four years for these positions. The tribe employs a cultural resources director to handle cultural resource issues. The Fantasy Springs Casino and Resort in Palm Springs is operated by the tribe.

Cahuilla Band of Mission Indians

The Cahuilla Indian Reservation is located about 25 miles east of Temecula and 35 miles west of Coachella Valley, based out of Anza (BIA 2012:107). The federally recognized reservation was established in 1875 and today consists of about 60 homes on 18,884 acres of land. There are currently 325 enrolled Cahuilla members (Cahuilla Band of Indians 2013a).

The Cahuilla tribal government consists of a five-member tribal council elected by the general membership. The Council consists of a tribal chairperson, a vice chairperson, a secretary, and two council members. In addition, various tribal committees are appointed to address specific government functions within the tribe. Major sources of income for the tribe include the Cahuilla Casino, the Cahuilla Travel Website, and the Cahuilla Smoke Shop. In addition, the tribe has recently allocated 2,000 acres for future economic development, including renewable energy development, commercial warehousing, and a gas station/convenience store (Cahuilla Band of Indians 2013b, 2013c).

Morongo Band of Mission Indians

The Morongo Reservation was established in 1876, and is located in Banning, California (BIA 2012:108). Members of the reservation are of the Serrano, Cupeño, and Cahuilla groups. In terms of area, at 35,000 acres, the Morongo Reservation is the largest of the Cahuilla reservations (Bean 1978: 584-585, Table 3).

The Morongo Band of Mission Indians is a federally recognized group governed by a tribal council consisting of a chairperson and vice chairperson, as well as five council members. The tribe is the largest private-sector employer in the Banning region, and its economic resources include agriculture, cattle, recreation, the Four Diamonds Resort, the Morongo Casino Resort and Spa, restaurants, and a golf course, among other businesses. The tribe maintains a cultural heritage program to promote the tribe's history, language, and connection to the land (Bean 1978: 585, Table3; MBMI 2013a, 2013b).

Ramona Band of Cahuilla Indians

The Ramona Indian Reservation was established in 1893 at the base of Thomas Mountain, in Anza, California. In 1970, there were only two members of the tribe, neither of whom lived on the 560 acre reservation (Bean 1978: 585, Table 3). The members of the Ramona Tribe are direct descendants of the *Apapatchem* clan, known as the "Medicine People". The reservation is located in the area where historically this clan gathered food, water, and medicine, and held spiritual ceremonies and celebrations.

The tribal government of the federally recognized Ramona Band of Cahuilla Indians consists of a tribally elected tribal chairperson and vice chairperson. One of the major economic vehicles for the tribe is the Ramona ecotourism project. This is a Department of Energy funded project to develop renewable energy projects in remote locations. The tribe will be one of the first "off-grid" reservations, using wind, solar photovoltaic/propane generator hybrid systems to generate between 65-80 kwH/day to power the reservation's housing, offices, and business ventures (RBCI 2005a, 2005b).

Soboba Band of Luiseño Indians

The federally recognized Soboba Indian Reservation was established in 1883 on a 3,172-acre parcel that included the village of Soboba. A non-Indian individual also claimed ownership of some of this land. After several legal battles, the private land was purchased by the Federal government and was then held in trust for the people of the Soboba band by the Department of the Interior. Today the Reservation encompasses almost 7,000 acres and there are about 1,200 enrolled tribal members (SBLI 2013a).

The Soboba Indian Reservation is located in San Jacinto, California (BIA 2012:110). The Tribal Council consists of a tribally elected chairperson, and a vice chairperson, a secretary, a treasurer, and a sergeant-at-arms who are elected by the Tribal Council (Soboba Band of Luiseño Indians 2013b, 2013c).

Torres-Martinez Desert Cahuilla Indians

The Torres and Martinez Reservations were established independently in 1876. Later, under the Relief of Mission Indians Act of 1891, these two reservations were combined. The federally recognized Reservation encompasses about 18,223 acres near Thermal, California (Bean 1978: 585, Table 3; TMDCI 2013a).

The tribal government of the Torres Martinez Tribe consists of eight tribal council members who are elected by the general membership. The Council members consist of a chairperson, a vice chairperson, a secretary, a treasurer, and four non-office holding members (TMDCI 2013a, 2013b. The tribe employs over 150 people in positions within various tribal departments (e.g., accounting and finance, environmental protection, planning, security), and owns and operates the Red Earth Casino (TMDCI 2013c).

Serrano

The Serrano were historically located in the San Bernardino Mountains, east of Cajon Pass. When an *asistencia*, an outpost of the San Bernardino mission, was established at Redlands in 1819 the Spanish forced most of the Western Serrano into the missions away from their homeland. Those who were located in the area north of San Gorgonio

Pass, near Banning, California were able to preserve what remains of Serrano culture today (Bean 1978: 573).

San Manuel Band of Mission Indians

The San Manuel reservation was established in 1891 near Highland, California (BIA 2012:109). The federally recognized reservation is the home of the *Yuhaviatam* Clan of Serrano Indians, and is named after tribal leader Santos Manuel. The reservation consists of 800 acres of mostly mountainous land in the San Bernardino highlands.

The San Manuel Tribal Council consists of a seven-member tribal council who serve as the Business Committee. The Tribal Council has a chairman, a vice chairman, a secretary, a treasurer and three business committee members who are elected by the General Council. The General Council consist of all adults 21 years or older. The San Manuel Band of Mission Indians is one of the largest employers in the Inland Empire. Their economic ventures include the San Manuel Indian Bingo and Casino; the Four Fires hotel in Washington, D.C.; the Three Fires hotel in Sacramento, California; and, commercial real estate (San Manuel 2013a, 2013b).

Other Groups with Native American Interests

La Cuna de Atzlan Sacred Sites Protection Circle

La Cuna de Atzlan Sacred Sites Protection Circle are a group of concerned citizens and Native Americans dedicated to the preservation of earth figures and other Sacred Sites in and around the vicinity of Blythe, California. The group has filed a petition, and currently are interveners for the PSEGS project. Two letters and a report have been submitted on behalf of the group (Figueroa 2013a, 2013b, 2013c). A synopsis of the La Cuna de Atzlan world view and related sacred sites is described below.

In general La Cuna de Atzlan suggests an iteration of migration theory that suggests that an area, vertically and horizontally, centering about the Granite Mountains (directly north of the project area) is a center of an ancestral land that was abandoned thousands of years ago. The people migrated south to eventually form the great Azteca/Mixteca nation. La Cuna de Atzlan interprets the codices, and related stories produced in central Mexico that commemorate the history of the Aztec, to suggest that the codices refer back to the homeland or “Island of Atzlan.” The interpretations rely on aligning iconic codex images with local Native American oral history, related sites, places and areas, landforms (such as the various mountains), mountain shadows viewed at particular times of the day and seasons, and solar and other astronomical and cosmological signs and movements (Figueroa 2011:7-31).

La Cuna de Atzlan asserts that the Chuckwalla Valley rests in the southwest quadrant of the homeland, and claims that solar projects, including the Palen project, are impacting this homeland. Specifically, the advocacy group suggests that the PSEGS is placed in a visual and spiritual trajectory between the Ripley intaglios (located several miles south of Blythe and adjacent to and on the east side of the Colorado River), the petroglyphs at Dragon Wash and a ‘v’ notch of two Eagle Mountain peaks where the sun sets during the summer solstice. Various other assertions suggest that several large boulders near Corn Springs are mythological giants that hold up the space

between the earth and the sky and that the thirteen rock cairns along the trail at the western end of the Chuckwalla Valley are depicted on the famous Aztec Calendar (despite the rock cairns now being numbered at 19). These assertions tend to be contradictory of archaeological migratory theories and duplicate or divert from Native American interpretations of the same sites, places and areas on a case-by-case basis. In summary, to quote from the Preface to Alfredo Figueroa recently revised book, Boma Johnson, a long term and now retired BLM archaeologist who has extensively studied the Lower Colorado River area, says: “I see many difficulties in his reasoning and lines of evidence, yet I see enough good evidence to intrigue me.” (Figueroa 2011:viii).

Historic-Period Background

The following information has been taken directly from the September 2010 RSA that was completed as part of the original siting case.

The project is located in an area that has historically been and remains remote from centers of development and settlement. The primary themes in this discussion focus on Spanish and Mexican routes through the desert, and early American traffic, mining, transportation, military training, power transmission, and agriculture/ranching.

Spanish and Mexican Routes through the Desert

Sixteenth-century maritime Spanish explorer, Hernando de Alarcon, made the first in-roads into the region in 1540, ascending 85 miles up the Colorado River to the head of navigation near present-day Yuma. Alarcon was sent to supply Coronado’s land expedition that had set out on foot from Compostela, Mexico, in search of the fabled seven cities of gold. He eventually cached the supplies and departed after waiting many days. Melchior Diaz, leading a small contingent of Coronado’s land unit, later arrived and recovered the supplies. Both Alarcon and Diaz reported the bleak nature of the country. The interior of the Colorado Desert was not explored further until 1702 when Father Eusebio Francisco Kino, a Jesuit missionary, situated in Sonora, began seeking an overland route to coastal California (Rice et al. 1996; Hague 1976; Von Till Warren 1980, pp 83–88).

Nearly seventy years later, Francisco Garcés (a Franciscan Padre) also seeking a route to the coast, forded the Colorado River at the mouth of the Gila River, traveling west through the desert before despairing and turning back. His efforts were eventually rewarded in March of 1774, arriving at Mission San Gabriel, accompanying the expedition of Captain Juan Bautista de Anza (Rice et al. 1996, Hague 1976). Two mission outposts were subsequently established near present-day Yuma in 1779 to minister to the native Quechan and strengthen Spain’s hold on this strategic point of entry into California. All passage along this route, later known as the Anza or Yuma Trail, was discontinued in 1781 when the Quechan revolted and killed over thirty missionaries, settlers, and soldiers, including Garcés.

Jose Maria Romero, a Mexican Army captain, explored a second route between 1823 and 1826, along the indigenous Halchidhoma Trail. He had learned of this route a couple of years earlier when a group of Cocomaricopa Indians from Arizona arrived at Mission San Gabriel, having reportedly crossed the Colorado River near present-day Blythe, journeying westward through the Chuckwalla Valley and over the San Gorgonio

Pass. On January 6, 1824, Romero was likely in the vicinity of Palen Lake (Bean and Mason 1962, pp. 40–41), having made his way up the Salton Wash, between the Orocopias and Chuckwallas. Estudillo, one of the members of the expedition, noted horse paths and footpaths of the Indians, and bones along the trail (Johnston 1980).

Early American Trans-Desert Crossings

In 1846, during the opening stages of the Mexican-American war, General Stephen Watts Kearny led an advance column of the United States Army into the region. From Santa Fe, Kearny's troops entered California by way of Yuma, reaching San Diego in December, having abandoned their wagons shortly after crossing the Rio Grande. The war ended in 1848 with the signing of the Treaty of Guadalupe Hidalgo.

Only days after the Mexican-American War ended, gold was discovered, kicking off the California Rush of 1849. It is estimated that more than 100,000 travelers passed by way of the Yuma Crossing.[9] The presence of so many travelers along the route had a definite impact on the desert. Whereas previous expeditions made the journey in isolation, during the Gold Rush, trails became relative highways. Companies of miners frequently encountered one another or ran across the remains of recently vacated campsites. The desert floor also became littered with articles abandoned when they either fell apart or proved too heavy or cumbersome for their weary owners. Broken wagons, furniture, articles of clothing, tools and even weapons left by the side of the road proved to be a bonanza for scavengers (Lamb n.d.).

After 1851, travel to California along the southern route through the Colorado Desert declined (Lamb n.d.). Horse traders and livestock drovers still used the trail to drive herds from Texas and Mexico to California and the U.S. Army continued to send caravans of provisions from San Diego to its outpost, Fort Yuma, at least until 1852. Emigrants, moving west, however, were more apt to be settling in southern California as farmers or ranchers instead of prospecting for mineral resources.

Desert Land Act, Entrymen, and Homesteading

Anglo-American homesteading and settlement in the Chuckwalla Valley was dependent upon the access to groundwater. The first known documented well was that of Hank Brown likely in the vicinity of Gruendike Well, about 3 miles west of the PSEGS project area. Brown also reportedly blazed a wagon road for the boundary surveys up Salt Creek Pass between the Orocopia and Chocolate Mountains and on toward present-day Desert Center (Warren and Roske 1981, p. 17).

Some twenty years later, Congress, to encourage and promote economic development of the arid public lands of the West, passed the Desert Land Act in 1877. Through this act, individuals could apply for entry onto public lands that could not produce a paying crop without artificial irrigation. After four years demonstrating proof of reclamation and improvements, desert entrymen would gain title to the land.

[9] http://www.yumaheritage.com/history.html

Brown's offspring, Floyd Brown, was probably one of the earliest participants in the desert land entry program. It does not appear that many others joined him until a quarter century later. In 1908, a subsidiary organization to the Edison Light and Power Company of Los Angeles, the Chuckwalla Land and Power Co., obtained a number of claims on the California side of the Colorado River north of Parker with the intent of building a dam to generate power and irrigate the Chuckwalla Valley, 40 miles to the west.[10] By the following year, practically all the land in the valley was taken, either by purchase, desert claim, or homestead under the encouragement offered by the development company. The Santa Fe Railroad even had plans to build from Palo Verde through the heart of the valley (Los Angeles Herald 1910). Unfortunately, the Department of the Interior, of the opinion that it was a promoter's pipe dream, refused to sanction the scheme.[11]

Four years later, the California Conservation Commission reported to the Governor and Legislature that while the power and irrigation project had been abandoned by the Chuckwalla Development Company, a group of 410 desert entry men had formed the Chuckwalla Valley and Palo Verde Mesa Irrigation Association to proceed with the project independently (California Conservation Commission 1913). Most of these men were facing forfeiture of their lands and a loss on their investments, not being able to show final proof of securing water. The Senate and House Committees on Public Lands, recognizing their hardship, passed legislation granting them an extension (an exemption from cancellation for a period of one year) to give them time to carry out their plans (U.S. House of Representatives 1913). The Chuckwalla relief act benefited 780 entrymen, nearly 100 of whom were situated within the PSGES vicinity.

In 1909, at the start of the land rush, Brown's well was reportedly 300 feet deep, and plainly visible from the road, with two adobe buildings and a corral near it (Mendenhall 1909). A couple of years later, a man named Peter S. Gruendike settled in the valley not far west of the PSEGS (Wharton 1912). Gruendike's well is in the same general vicinity of Brown's and may be one-and-the-same. Gruendike was an active entryman, publishing an account of his Mountain View Experimental Ranch in *Out West* in 1911. By then, he had a good 10-foot-tall windmill in working order and a large tank, along with many kinds of trees planted and 300 or more palms of different kinds. At the time, he was very enthusiastic regarding the future outlook, having visions of growing hay, grain, melons, grapes, dates, cotton, and all citrus fruits. His land was patented in 1916.

Stephen Ragsdale, a cotton farmer from Palo Verde Mesa, acquired Gruendike's property in 1915 and began operating a towing business at the establishment. Six years later, when Route 60 opened a mile or so to the north, he uprooted and founded the tiny settlement of Desert Center, midway between Indio and Blythe.[12] Desert Center, at that time, consisted of a café with an attached gasoline station, a towing service/repair garage, a market, post office, several cabins for travelers, and a swimming pool. In addition to supporting tourism by providing sparse amenities for travelers, Desert Center supported the local farming community, and a couple of mobile home parks.

[10] *Imperial Valley Press,* February 27, 1909, September 17, 1910.

[11] *Imperial Valley Press,* June 3, 1911.

[12] http://en.wikipedia.org/wiki/Desert_Center_California

Desert Driving and Automobile Roads

Automobiles began seriously replacing buckboards (four-wheeled wagons drawn by a horses or mules) about 1910.[13] Because of bad roads, the high-centered Model-T became the vehicle of choice. At that time, no maps, road signs, or service stations existed. Venturesome motorists in Southern California faced with these circumstances, banded together in 1900 to form a touring club and began publishing a monthly magazine with tips on travel and directions to popular destinations (Von Till Warren 1980, p. 92). As desert driving could be perilous, motorists began advocating for better information and road assistance. In 1917, the U.S. Geological Survey erected signs directing travelers to water at 167 localities in California's desert (Thompson 1921). The California Department of Engineering, after paving its first auto road in 1912, began issuing maps in 1918 (Von Till Warren 1980, p. 92).

In 1915, the Chuckwalla Valley Road was essentially ninety miles of blow sand and cross washes with a couple of ruts. It was not until 1936 that U.S. Highway 60-70 between Indio and Blythe was paved (Norris and Carrico 1978). In 1968, this highway became Interstate 10 (I-10), a major transportation corridor through the Chuckwalla Valley today, connecting Los Angeles and Phoenix. Most other roads in the area remained unpaved.

Canals and Capital, Irrigation in the Colorado Desert

The paucity of water in the desert prior to irrigation made agriculture a challenge. Plans to improve matters began as early as 1880s. Thomas Blythe, an investor from San Francisco, bank rolled the construction of a canal in the Palo Verde Valley,[14] forty miles east of the PSEGS. The water, taken from a swamp area called Olive Lake, was used to irrigate pasturelands and small agricultural plots. With Blythe's death in 1883, no further agricultural development in the valley occurred until the turn of the century. In 1904, the Palo Verde Land and Water Company purchased the Blythe Estate and began the task of constructing additional canals and intake structures. As previously mentioned, the desert entrymen formed the Chuckwalla Valley and Palo Verde Mesa Irrigation Association in 1913. Flood damages inflicted by the Colorado River, however, necessitated the formation of the Palo Verde Joint Levee District in 1917. The Palo Verde Drainage District was later established in 1921.[15] Two years later, the state legislature was petitioned to pass the Palo Verde Irrigation District Act in order to better administer both irrigation and drainage functions.

Although schemes to appropriate Colorado River waters began as early as 1859, the first major canal, the Alamo, was not constructed until 1901 (Harrington 1962). It conveyed water to the Imperial Valley for two years before becoming choked with silt (Von Till Warren 1980, p. 99). A temporary measure to bypass the blocked areas resulted in disaster when a spring flood in 1905 diverted the whole river into the Salton Sink, creating the body of water known today as the Salton Sea. The task of turning the river back into its main channel was extremely difficult and complicated by the fact that the canal had been built on both sides of the U.S.-Mexican border making the repair an

[13] http://www.dustyway.com/2008/12/desert-driving-in-early-days.html

[14] http://www.pvid.org/History.html

[15] It is not clear whether the desert entrymen were involved in the formation of the drainage district.

international effort. In response to this disaster, the California Irrigation District Act was passed in 1911. The Imperial Irrigation District was subsequently formed to straighten out the mess, acquiring the properties from the bankrupt irrigation company.

In the first decade of the twentieth century, farmers in the Coachella Valley, west of the PSEGS relied solely upon groundwater from artesian wells, planting extensive dates, figs, and grapes (Von Till Warren 1980, p. 98). By 1918, however, the water table had become seriously depleted. The Coachella Valley County Water District was subsequently formed to promote water conservation and control distribution. With completion of a new and improved "All-American Canal" to irrigate the Imperial Valley in 1940, communities in the Coachella Valley began forming plans to tap into it. The Coachella Canal, 122 miles long, was built nine years later.

The Colorado River Aqueduct is a water conveyance structure operated by the Metropolitan Water District of Southern California. It impounds water from the Colorado River at Lake Havasu on the California-Arizona border west across the Mojave and Colorado deserts to the east side of the Santa Ana Mountains. Its construction, between 1933 and 1941, required an army of 5,000 men. It is recognized as one of the engineering marvels of the modern world and was nominated as a National Historic Engineering Landmark by the American Society of Civil Engineers.[16,] A portion of this aqueduct tunnels through the Coxcomb Mountains north of the Chuckwalla Valley and the PSEGS.

Hydroelectric Power Transmission

During the late nineteenth century, history was made generating and transmitting electricity in Southern California's Inland Empire.[17] Pioneer engineers and entrepreneurs took the industry's first steps toward large capacity power plants and long distance power transmission nearly 125 years ago. Charles R. Lloyd and Gustavus Olivio Newman built California's first hydroelectric power plant in western Riverside County in 1887. It relied upon water from a canal in Highgrove at the base of a 50-foot elevation drop. It began by powering 30 outdoor arc lights (15 in Colton and 15 in Riverside) from a direct current dynamo (Powers 2009).

In the early 1890s, direct current (DC) relied upon a distributed system involving many power plants and numerous short transmission lines because it was not practical to vary the voltage to meet differing consumer requirements for lighting and motorized appliances. Further, DC systems were inefficient because low-voltage transmission necessitated conveyance of high-currents through resistive conducting wires resulting in large energy losses. In contrast, alternating current (AC) relied upon a centralized system involving fewer power plants, long-distance transmission lines, and transformers to step down the voltage, essentially enabling the conveyance of high-voltages at low-currents, thereby reducing resistance and energy loss.

[16] http://www.mwdh2o.com/mwdh2o/pages/about/history4.swf
[17] http://www.edison.com/files/backgrounder_mtview_historic.pdf

In September of 1893, while the dominant electric companies were fighting over the emerging electric power standards (DC versus AC), the small community of Redlands, in San Bernardino County, managed to engineer and complete the first commercially viable power plant in the United States (Myers 1983; Hay 1991). With the foresight of Almarian Decker, long-distance electric power transmission was achieved via transformers and the development of a revolutionary three-phase AC generator. Decker's power generation and delivery system was so successful that it became the Southern California standard.

Hydroelectricity, referred to as "white coal," was a clean and inexpensive source of power that enabled industrial capitalism to take hold in the West (Teisch 2001). Engineers began to dam western rivers for electricity in the 1890s, just as the hydraulic mining industry declined. Citizens, politicians, and reformers viewed electricity as a necessity that would dramatically uplift the country's standard of living. Water and power companies like Edison Light and Power Company of Los Angeles (later known as Southern California Edison), seeing big money, made every effort to control the stakes.

Before 1913, the highest voltage lines in the Los Angeles area were operated in the 10–75-kV range. Some of the earliest distribution lines were built to serve rural communities (Taylor 2005). During the 1930s, any circuits built were those that extended lines constructed a decade earlier. Many of these lines focused on following railroad spur lines and existing distribution lines to growing communities.

The first electricity came to Blythe in 1917. Two 50-watt diesel engines generated power 18 hours a day. It was not until 1930 that this system was abandoned when a 70-mile-long transmission line was constructed connecting Blythe with Calipatria in the Imperial Valley, where the line's main system was located. In the 1950s, the Blythe-Eagle transmission line was constructed. It was a 161-kV transmission line that connected the Blythe-Eagle Mountain Substation in Blythe to a substation near Eagle Mountain (Myers 1983). The other transmission line in the vicinity of the PSEGS is the Devers-Palo Verde- line, a 500-kV lattice-tower transmission line constructed in 1982. It connects a plant in Arizona with a substation near Palm Springs.

Mining

The history of mining in Chuckwalla Valley, as throughout much of the rest of Riverside County, is a narrative of relatively sporadic, small-scale activity. Mining of gold, silver, lead, copper, uranium, fluorite, and manganese took place here and there across the county. The mountains surrounding Chuckwalla Valley contain several valuable mineral deposits, including copper, gold, silver, iron, quartz, manganese, and gypsum, with the only sustained mining having been iron mining in the eastern Eagle Mountains and gypsum mining at Midland in the Maria Mountains (Shumway et al. 1980:17).

One of the earliest mining discoveries in the region, and the first gold strike in the desert region of Riverside County, was a deposit located by Captain Paulino Weaver in the Mule Mountains in the spring of 1861 (Shumway et al. 1980:17). It does not appear that Weaver spent much time exploring this deposit because a year later Native American informants led him to gold deposits on the eastern side of the Colorado River near La Paz, Arizona (approximately six miles north of present-day Ehrenberg, in western Arizona) which set off a major gold rush that drew large numbers of prospectors to the

region (Johnson 1972:77). Not long after, miners began combing the mountains on either side of the Chuckwalla Valley. Gold and iron deposits may have been discovered as early as 1865 in the Eagle Mountains and by 1889 there was an established mining interest in those mountains. The Coyote mine was established in 1892, three miles southwest of Cottonwood Springs, and the Iron Chief mine was established around 1892, both of which were in the Eagle Mountains. Ownership of the Iron Chief mine changed hands in 1897, but the buyer never completed payment and the original owners installed a cyanide plant and operated the mine until 1902, extracting about $150,000 worth of gold ore over the 10-year life of the mine. This mine, along with several other claims in the Eagle Mountains, was sold to Southern Pacific in 1909 but lay dormant until 1944 when Kaiser Steel purchased the property. In June of 1948 Southern Pacific completed construction of a 52-mile rail line connecting the Iron Chief mine to the mainline tracks, and Kaiser began mining operations at the Bald Eagle mine about the same time. Today these mines are still in operation, and the company-run community continues to thrive (Shumway et al. 1980:20). Other notable mines in the Eagle Mountains included the Black Eagle mine which operated from 1923 to 1928, and again from 1935 to 1940, the Storm Jade mine, which was operated from 1956 to 1967 by Barry Storm who believed that this mine was the source of Mayan jade (Shumway et al. 1980:21), and the Messenger mine which was in operation as early as 1896 (Crawford 1896:312-313).

Mining in the Chuckwalla Mountains began in 1877 by a Mr. Hathaway (early on, the mountains were referred to as the Hathaway Mountains) of San Bernardino, but it was a gold strike in the late 1880s which started a gold rush to the area. By 1887 the Pacific Mining District had been established in the Chuckwallas and encompassed an area about 12 miles by 30 miles in extent. Sixty claims were filed by the end of that year, but the boom fizzled by 1890 because the owners never had enough capital to work their respective claims properly (California State Mineralogist 1890). The Granite and San Diego mines were established in 1894 in the northwestern portion of the Chuckwallas, south of Granite Well (Shumway et al. 1980:22). The San Diego mine was located about four miles from Long Tank and was owned by E.E. Bowles of San Diego (Crawford 1894:224) until at least 1924 when the Chuckwalla Mining and Milling Corporation reactivated the property, overhauled the old, onsite mills and extracted and processed ore until 1929. Many other mines are known in the Chuckwallas, including Coffee mine, a quartz mine four miles south of Corn Spring and operated jointly with the Ritchie mine as early as 1896 (Crawford 1896:313), Lane mine which was southeast of Granite mine and operated in 1896, Bryan mine which was two miles south of Corn Spring and in operation from 1898 to 1900, and the Red Cloud mine in the western portion of the Chuckwallas. In 1896 the Sterling mine was operated by the Sterling Mining Company of Los Angeles, two years later the 40 claims of this mine were under control of the Red Cloud Mining Company. Ownership of the property changed hands again around 1915 to J.M. Huston of Los Angeles and the Red Head Group, but the mine was abandoned by 1918. In November of 1931, the mine was reactivated when a small amalgamation plant was built. The mine was leased until 1940, and in 1945 all of the mining equipment was removed (Shumway et al. 1980:22-23).

Transportation of ore from the Chuckwallas was problematic in the early days of mining in the region. There were few developed roads or railroads in the area. Sensing a demand for his services, in 1912 E.L. Blake operated the “Chuckwalla Express” with his two burros, hauling ore between Mecca and the Chuckwalla Mountains. There were many miners in the region during 1912, especially camped out at Chuckwalla Spring in the southern portion of the mountains, and the Chuckwalla Mountains made the news for non-mining events when there was a murder at the placer diggings at Chuckwalla Spring in March of that year (Shumway et al. 1980:34-35).

In the early 1880s, Matt Palen and William McCoy prospected in the Palen, McCoy, and Maria Mountains, and, in 1880, Palen and H. Connor discovered copper deposits, as well as gold and silver, in the west-central portion of the Palen Mountains. By 1900 two small copper mines had been established in the Palen Mountains in addition to Matt Palen’s, the Homestake mine (also known as Lightfoot mine) in the central portion of the eastern Palens, and the Orphan Boy mine about two miles south of Packard’s Well. Palen’s mine and what was likely his home was rediscovered in 1969, and the deposits were found to still be rich in copper, silver and gold ore. In September of 1913 iron was discovered in the extreme southern portion of the range, but the claim does not appear to have been developed (Shumway et al. 1980: 27). Copper mining in the Palen Mountains appears to have reached its zenith during the second decade of the twentieth century with activity at the Fluor Spar Group, Homestake Group, Crescent Copper Group, Orphan Boy, and Ophir mines. Most of these mines were abandoned by 1917 (California State Mineralogist 1919).

The Ironwood Mining District has been active since 1929 (Figueroa Brothers 1987:2) and encompasses claims in the Palen, McCoy, Arica, and Maria Mountains. Minerals mined in the Ironwood District include copper, gold, silver, zinc, lead, manganese, and gypsum. Numerous claims are contained within the District including, the Crescent Group with 40 claims on 700 acres (Stevens and Weed 1914:481) and the Badger State Group with 10 claims on the east side of the McCoy Mountains. The mines were active until ownership was transferred to the Crescent Group (Hamilton 1917:524), and once these mining operations were combined they came to be known as the Eagle Nest Copper mine, although the mines are currently idle (Bradley 1945). In addition to the mines in the Palen Mountains mentioned above, other mines in the Ironwood Mining District include the Arica Group with 28 claims on 560 acres (Stevens et al. 1920:417), the Mountain King Group with three claims on the east side of the McCoys, the Fluor Spar Group with three claims on the west side of the Palens (Hamilton 1917:525), the Black Jack Manganese mine and the Bray Manganese mine in the McCoy Mountains which were in operation until July of 1919 (Hamilton 1920:36), and Montague Mascot who made four gypsum claims in the northwest portion of the Palen Mountains in 1904, and an additional 13 claims by May of 1906 (Shumway et al. 1980: 30). Demand for manganese during the First World War was high, and manganese mining in the McCoy Mountains during this time period flourished with as many as 10 active mines. The price of manganese fell with the end of the war, but with the start of World War Two demand again increased and the Arlington mine in the McCoy Mountains began shipping out ore in February of 1942 (Shumway et al. 1980:29). The Palisade mine was a rich deposit of zinc, lead, copper, silver, bismuth and gold located in 1918 in the Little Maria Mountains, and stayed active until about 1920. The mine remained idle until about 1950

when the property was renamed the Bald Eagle mine and operated for two years (Shumway et al. 1980:28-29).

Gypsum mining in Midland began in earnest in the early 20th century, with numerous claims staked by various different groups between 1907 and 1908. In 1910 the United States Gypsum Company conducted extensive prospecting of these claims in an effort to determine the value of these gypsum deposits. The Company purchased these claims in 1911 and began drilling holes and preparing the property but had to wait to conduct large-scale mining until 1916 when a rail line was completed. Mining at the property didn't fully commence until after the First World War, and in 1925 the first shipment of crushed gypsum left Midland. Operations continued and multiple production facilities and housing units were constructed to facilitate the growing business. The Midland facility shut down operations in December of 1960 (Shumway et al. 1980: 31-33).

Military Activities

Desert Training Center

In 1942, during World War II, Gen. George S. Patton established the Desert Training Center/California-Arizona Maneuver Area (DTC/C-AMA) in a sparsely populated region of southeastern California, Arizona, and Nevada. Its purpose was to prepare tank, infantry, and air units for the harsh conditions of North Africa, practicing maneuvers, developing tactics, and field testing equipment (Meller 1946). The installation, in operation for two years (until the end of the war), was 16,000 square miles in extent. It was the first simulated theater of operations in the United States. Its location was chosen for its unforgiving desert heat, rugged terrain, available telephone communications system, and accessibility by established railroads and highways (Henley 1992, pp. 5–7; Howard 1985, pp. 273–274).

Seven camps were established for divisional use. Camp Young, near Indio, served as the main headquarters (Crossley 1997). Camp Desert Center was located between Chiriaco Summit and the community of Desert Center in T5S/R14E, Sections 26, 28, 30, 32, and 34; and T4S/R15E, Sections 1–15, 17, 18, 22, and 30-34 (Ickes 1942, pp. 1–2, as cited in Bischoff 2000, p. 58). It encompassed 34,000 acres, consisting of an encampment with temporary housing structures, an evacuation hospital, observers' camp, an ordnance campsite, quartermaster truck site, and maneuver area (USACOE 1993, p. 3). The Desert Center Army Airfield was situated just northwest of the community of Desert Center. It contained two paved runways, more than 40 buildings (officer's quarters, a mess hall, a dispensary, a headquarters building, a recreation hall, a link trainer building, a hangar, various supply buildings, an operations building, a power house, a pump house, a control tower), a well, and a 10,000-gallon water tower (Bischoff 2000, p. 93).

In 1986, BLM planned to nominate each of the seven division camps to the NRHP, to develop an interpretive program for the DTC/C-AMA, and to provide historical resources protection through designation as an Area of Critical Environmental Concern (ACEC) (Bischoff 2000, p. 134). Subsequently, Bischoff (2000, p. 133), in considering the historical and archaeological contexts for the DTS/C-AMA, found that it was a historically significant resource under all four criteria of the NRHP. As such, he

recommended that the facility be nominated to the NRHP as a discontiguous district of clearly functionally and temporally related resources. He further proposed that the facility be recorded as multiple properties consisting of contributing and noncontributing elements of the district. DTC/C-AMA can be thought of as an interconnected landscape of WWII training sites that are highly significant for their association with Gen. George S. Patton and for their contributions to our understanding of how American soldiers were trained during WWII.

Desert Strike

During the Cold War years, relations between the United States and the Soviet Union were diplomatically strained, primarily as the result of the bi-lateral proliferation of nuclear weapons. While a campaign promoting the nonproliferation of nuclear weapons began in 1958, a treaty was not signed until 1970. Thus, amid worries of nuclear war, a two-week training exercise was launched in 1964, called Desert Strike. It involved over 100,000 men, 780 aircraft, 1,000 tanks, and 7,000 other vehicles along the banks the Colorado River and adjoining desert valleys ranging over 150,000 square miles of California, Nevada, and Arizona (Garthoff 2001, p. 199; Nystrom 2003). Four Army divisions, three Army Reserve and National Guard brigades, and fifteen tactical Air Force squadrons took part.

The exercise was a two-sided enactment, with fictitious world powers “Calonia” and “Nezona” sharing a common border at the Colorado River. The premise of the conflict between these two entities, each led by a Joint Task Force, was a dispute over water rights. Major tactical operations during the exercise included deep armored offensive thrusts, defensive operations along natural barriers, counterattacks including airmobile and airborne assaults, and the simulated use of nuclear weapons. The Air Force provided fighter, air defense, interdiction, counter-air reconnaissance, and troop carrier operations in support of both joint task forces.

In the first phase of Desert Strike, Calonia initiated mock battle with a full-scale invasion of Nezona. A new concept for military river crossings was put into operation during this invasion, accomplished with a combination of assault boats, amphibious armored personnel carriers, ferries, bridges, and fords at eight major sites along a 140-mile stretch of the Colorado River. The practice of attack and counterattack continued into a second phase, in which simulated nuclear strikes and airborne assaults were traded between the forces. Heavy equipment, such as the M60 tank, was used during practice maneuvers, and the track marks can still be seen across the desert (Prose and Wilshire 2000).

CULTURAL RESOURCES INVENTORY

A project-specific cultural resources inventory is a necessary step in staff’s effort to determine whether a proposed project may cause significant effects to historically significant cultural resources (i.e., historical resources) and would therefore, under CEQA, have a significant adverse effect on the environment.

The development of a cultural resources inventory entails working through a sequence of investigatory phases. Generally, the research method proceeds from the known to the unknown. These phases typically involve doing background research to identify known cultural resources, conducting fieldwork to collect requisite primary data on not-yet-identified cultural resources in the vicinity of a proposed project or project amendment, assessing the results of any geotechnical studies or environmental assessments completed for a proposed facility site including ancillary infrastructure, and developing recommendations of historical significance (see "Determining the Historical Significance of Cultural Resources," below) for any cultural resources that are identified.

This subsection describes the research methods used by the project owner and Energy Commission staff for each phase and provides the results of the research, including literature and records searches (California Historical Resources Information System (CHRIS) and local records), archival research, Native American consultation, and field investigations. Staff provides a description of each identified cultural resource, recommendations on their historical significance, and the basis for those recommendations. Assessments of the amended project's greater effect on historically significant cultural resources; potential effects on previously unidentified, buried archaeological resources; and proposed mitigation measures for all significant effects are presented in separate subsections below.

PROJECT AREA OF ANALYSIS (PAA)

The PAA is a concept that staff uses to bound the geographic area in which the proposed project has the potential to affect cultural resources. The effects that a project may have on cultural resources may be immediate, further removed in time, or cumulative. They may be physical, visual, auditory, or olfactory in character. The geographic area that would encompass consideration of all such effects may or may not be one uninterrupted expanse. It may include the project area, which would be the site of the proposed plant (project site), the routes of requisite transmission lines and water and natural gas pipelines, and other offsite ancillary facilities, in addition to one or several discontiguous areas where it could be argued the project could potentially affect cultural resources.

The project description included in the Petition for Amendment states that the project will no longer use the parabolic trough technology, as originally licensed, but will instead use solar power towers, associated power blocks, and heliostat fields. After review of the petition and a site visit to the project site and surrounding area, staff determined that the previous PAA used in the 2010 licensing was not adequate to analyze the potential effects that could occur, given this change in technology. Specifically, switching from relatively low profile, 25-foot-tall parabolic troughs to two, 750-foot tall power towers has the potential to effect cultural resources much farther away; therefore, the PAA has been expanded. Staff has observed in the field that the project will be plainly visible from at least 15 miles away. Therefore, staff has determined that, in order to adequately evaluate the new potential effects of the amended project, the revised PAA includes all visible areas within approximately 15 miles of the project area boundary (see **Cultural Resources Figure 1**). As shown in **Cultural Resources Figure 1** the viewshed extends much farther than 15 miles in some areas while in other areas the viewshed is less than 15 miles, due to the area topography. Staff has determined that this would

constitute the geographic area across which the project may have the potential to cast significant visual effects on cultural resources. The archaeological, ethnographic, and built-environment components of the PAA for the amended project vary with respect to the differences in the character of the inventory for each of these resource types, and are described separately below.

Archaeological Resources PAA

During the original analysis of the project's potential to affect archaeological resources, the PAA was largely limited to the minimum geographic standards set out in the Energy Commission's siting regulations. As has already been noted above, the proposed addition of two, 750-foot tall solar power towers to the licensed project significantly increases the intrusion of the vertical profile of the project across Chuckwalla Valley, relative to the visibility the project would have had if either of the reconfigured parabolic trough alternatives had been built as originally licensed. Due to this significant increase in visibility, the Archaeological Resources PAA has been expanded to include all visible areas within 15 miles of the project area boundary (see **Cultural Resources Figure 1**).

Ethnographic Resources PAA

The Ethnographic PAA encompasses the view shed within which it would be possible to see one of the two proposed solar power towers. In general the view-shed perimeter is delineated by the crests of the mountain ranges that define the combined Palen and Chuckwalla valleys. The ranges listed are provided in a clockwise direction and starting due north of the project are the Granite Mountains, Palen Mountains, McCoy Mountains, Mule Mountains, Little Chuckwalla Mountains, Chuckwalla Mountains, Eagle Mountains and the Coxcomb Mountains. While some higher elevation areas beyond the first ring of mountains can be seen, and while some closer areas cannot be seen because of intervening canyon walls or other intruding visual obstacles, staff is interested in analyzing only those resources that can be reasonably seen from the height of the solar power towers (see **Cultural Resources Figure 1**).

Built-Environment PAA

For built-environment resources in the rural context of the project site, and for each project alternative under the analysis for the original license, the PAA was defined as the project site and any above-ground linear facilities, plus a half-mile buffer. As previously stated, the addition of two, 750-foot solar power towers to the licensed project stands to significantly increase the visibility of the project across the Chuckwalla Valley, relative to the visibility of the project if it had been built as originally licensed. Due to this significant increase in visibility, the Built Environment PAA has been expanded to include all visible areas within 15 miles of the project area boundary (see **Cultural Resources Figure 8**).

DATA COMPILATION FOR PROJECT AREA OF ANALYSIS

Record, File, and Database Searches

Identification of cultural resources in the PAA, analysis of the significance of those resources, and the potential project-related effects requires resource information specific to the project area and vicinity. Various repositories in California hold

compilations of information on the locations and descriptions of cultural resources that have been identified and recorded in past cultural resources surveys. Consistent with the Energy Commission's Data Regulations, the then-applicant conducted background inventory research on the original PAA and provided the results as part of the PSPP Application for Certification (AFC). The following describes those efforts in 2009 through 2010.

CHRIS Records Search

The California Historical Resources Information System, or CHRIS, is a federation of ten independent cultural resources data repositories overseen by the California State Office of Historic Preservation. These centers are located around the state, and each holds information about the cultural resources of several surrounding counties. Qualified cultural resources specialists obtain data on known resources from these centers and in turn submit new data from their ongoing research to the centers. The project falls within the jurisdiction of the Eastern Information Center, which is housed in the Anthropology Department at the University of California, Riverside.

As a part of the original licensing process Palen Solar I, LLC's[18] cultural resources consultant, AECOM, submitted a records search request to the Eastern Information Center, at the University of California, Riverside, on January 29, 2009. This study area was of the project footprint and a one-mile buffer around the archaeological PAA (exclusive of the transmission route) established for the AFC as part of the original licensing. A supplemental records search was performed on October 15, 2009, to cover the transmission corridor and a half-mile buffer area. The following information is a result of those records searches. The additional records search for the expanded PAA was completed by the project owner and submitted to the Energy Commission in July and August 2013.

Previous Surveys

Twelve previous studies had been conducted within the original 2009 study area (including the buffer area outside the original archaeological PAA). These are summarized in **Cultural Resources Table 2**. It appears that less than 1 percent of the archaeological PAA under consideration in 2009 had been previously surveyed.

Four studies, related to Southern California Edison's Devers-Palo Verde- transmission lines, were conducted north of the original archaeological PAA (Cowan and Wallof 1977; Wallof and Cowan 1977; Westec Services, Inc. 1982; Wilson 2009). These same four studies reported on a linear corridor south of the original archaeological PAA. Three additional linear studies, south of the original archaeological PAA, include two along I-10 related to a pipeline project and a safety project (Greenwood 1975; Hammond 1981) and a fiber optic project along Chuckwalla Road (Underwood et al. 1986). Several localized surveys, scattered both in and out of the original archaeological PAA, relate to geotechnical boring and pole replacement projects (Crew 1980; BLM 1980; Schmidt 2005). The remaining investigations include a survey along Corn Springs Road (Martinez et al. 2008) and a reconnaissance along the dunes on the southeast edge of Palen Dry Lake (Ritter 1981).

[18] Palen Solar I, LLC was the project owner when the original license was issued.

Cultural Resources Table 2
Previous Surveys within the Original Study Area (2009 Records Search Limits)

Report No.	Date	Within Arch. PAA	Author(s)	Title
00161	1975	Y	Greenwood	Paleontological, Archaeological, Historical, and Cultural Resources: West Coast-Midwest Pipeline Project, Long Beach to Colorado River.
00190	1981	Y	Hammond	Archaeological Survey Report for the Proposed Safety Project on Interstate 10 Between Chiriaco Summit and Wiley's Well Overcrossing, Riverside County, California
00220	1977	Y	Cowan & Wallof	Interim Report: Fieldwork and Data Analysis: Cultural Resource Survey of the Proposed Southern California Edison Palo Verde-Devers 500 kV Power Transmission Line
00221	1982	Y	Westec Services, Inc.	Cultural Resource Inventory and National Register Assessment of the Southern California Edison Palo Verde to Devers Transmission Line Corridor (California Portion)
00222	1977	Y	Wallof & Cowan	Final Report: Cultural Resource Survey of the Proposed Southern California Edison Palo Verde-Devers 500 kV Power Transmission Line
00813	1980	N	Bureau of Land Management	Eastern Riverside County Geothermal Temperature Gradient Holes
00982	1980	Y	Crew	An Archaeological Survey of Geothermal Drilling Sites in Riverside County
01341	1981	N	Ritter	Archaeological Appraisal of the Palen Dry Lake Area of Critical Environmental Concern, Riverside County, California
02210	1986	Y	Underwood et al.	Preliminary Cultural Resources Survey Report for the US Telecom Fiber Optic Cable Project, From San Timoteo Canyon to Socorro, Texas: The California Segment
05245	2005	Y	Schmidt	Negative Archaeological Survey Report: Southern California Edison Company, Blythe-Eagle Mountain 161-kV Deteriorated Pole Replacement Project
08181	2008	N	Martinez et al.	Cultural Resources Study Regarding Motorized Vehicle Routes of Travel on Lands Managed by the Bureau of Land Management California Desert District in Imperial, Riverside, and San Bernardino Counties, California
unknown	2009	Y	Wilson	Letter Report: Archaeological Monitoring for the Geotechnical Investigation of the proposed Devers-Palo Verde No. 2 Transmission Line Project, Riverside County, California

Previously Recorded Resources

Twelve previously recorded resources were identified within the original 2009 study area, seven historic-period and five prehistoric archaeological sites (see **Cultural Resources Table 3**, below). These include: a segment of historical Chuckwalla Road, four early-twentieth-century tin can scatters and two isolates (a tin can and a 1940s general infantry periscope-style flashlight).

Cultural Resources Table 3
Previously Recorded Sites within the original Study Area (2009 Records Search Limits)

Period	Primary # (P-33-)	Site Trinomial (CA-RIV-)	Site Type	Constituents
Historic	13592		Tin can scatter	Church key opened beverage cans, juice cans, meat tins
	13681		Isolate	Hole-in-cap can
	13964	7648	Tin can scatter & section marker	Tin cans & wood fragments
	14161		Isolate	General Infantry periscope style flashlight
	17137	8920	Tin can & glass scatter	Hole-in-top cans, evaporated milk cans, glass fragments
	17138	8921	Tin can & glass scatter	Tins cans, glass fragments, and milled lumber
	17766		Road Segment	Rte 60/70 w/ associated diversion dikes (Chuckwalla Rd)
Prehistoric	n/a	893T	Trail Segment	None
	n/a	1515	numerous widely dispersed loci of sparse lithics & FAR (fire-affected rock) scatters over an extensive area	FAR, core fragments, flakes, cores, hammer-stones, cobble chopper tools, milling tools, bone fragments, projectile point, pottery sherds, turquoise pendant, and ring of boulders. Rumored fishhooks, fish bone, and possible human remains (burials and cremations).
	13591		Isolate	Quartzite biface
	14160		Isolate	Incised pottery rim sherd and body sherd
	14177		Cleared Circle Ring	None

Five prehistoric resources were identified outside the original archaeological PAA. Four, south of the project area, included: a remnant of a foot trail (CA-RIV-893T); a pottery sherd scatter (P-33-14160); a rock ring (P-33-14177); and an isolated quartz biface fragment (P-13591). One very large seasonal campsite, CA-RIV-1515, was identified and recorded by Ritter (1981), less than 0.5 mile to the northeast of the original PAA.

CA-RIV-1515 is situated within low dunes bordering the east edge of Palen Dry Lake bed. It is characterized as an extensive elongated scatter of cultural materials over approximately three miles of the playa. The site boundaries, as delineated, incorporate many small localities of activity. Noted associated artifacts included: scatters of fire-affected rocks, milling tools (mano and metate fragments), flakes of chalcedony, quartzite, and basalt, toolstone core detritus, a Rose Spring projectile point, isolated pottery sherds (probably Tizon Brown ware), quartzite hammerstones, quartzite cobble chopper-tools, scattered bone fragments (rabbit, tortoise, and large mammal), and a ring of boulders. Anecdotal information, derived from informants (reported to Ritter by Ed Carlson, District Ranger for Joshua Tree National Monument), suggests that fish bone and fishhooks also occur, along with burials and/or cremations, and beads. A probable turquoise pendant was found in 1975 at the north end of the site.

Reed (1981) prepared an Area of Critical Environmental Concern (ACEC) management plan and environmental assessment for Palen Dry Lake and CA-RIV-1515. The ACEC is situated adjacent to the PSEGS in an area encompassing 5.3 square miles (within all or parts of T5S R17E, Sections 23, 24, 25, & 26; T5S R18E, Sections 30, 31, & 32; T6S R17E, Section 1; and T6S R18E, Sections 5,6,7, & 8).

Further afield, outside the original CHRIS study area, Gallegos et al. (1980) discuss two other prehistoric sites associated with the northwest section of Palen Dry Lake, found during a cultural resources inventory of the Central Mojave and Colorado Desert regions (no numerical designations were assigned). Typical archaeological remains underlying the dunes in that vicinity include coarse abraders of basalt and chert, along with flakes of fine quality chalcedony and obsidian, as well as a few pottery sherds (Gallegos et al. 1980, p. 106). Notes associated with a collection of about 300 artifacts (mostly chipped stone, some ground stone, a few pottery sherds, and an unworked piece of turquoise) archived at the University of California Los Angeles (Accession No. 320), describe two areas: Area A (0.5 mile square at the northern edge of the lake) and Area B (located half a mile to the south of Area A).

Eight miles west-northwest of the project site, a major aplite toolstone quarry (CA-RIV-1814) was found during investigations for the Devers-Palo Verde transmission line study (Singer 1984). It was determined eligible for the National Register of Historic Places (NRHP). Also recorded during that study was a very large site (CA-RIV-1383) spread over 45 acres, with 33 loci, including 10 rock rings, 3 cleared circles, 170 petroglyphs, 3 trails, 79 potsherds, and sparse lithic scatters containing 193 flakes of aplite and quartzite. This site was also determined eligible for the NRHP.

Archival and Library Research

Detailed resource-specific information needed by staff may entail primary and secondary research in various archives and libraries. An applicant or owner may include archival information as part of the information provided to staff in an AFC or petition to amend, or may undertake such research to respond to staff's data requests. Staff may also undertake such research to supplement information provided by the applicant or owner. The following describes the efforts that were undertaken during the original licensing case. Archival research concerning ethnographic resources has been completed and is detailed in the ethnographic section of this assessment.

Along with conducting the records search, AECOM also visited both the General Patton Memorial Museum (on April 30, 2009) and the Palo Verde Historical Museum and Society (May 4–5, 2009) in order to learn more about regional history. The General Patton Museum is located at Chiriaco Summit near Desert Center and contains information about the Desert Training Facility and other military history related to the project area. The Palo Verde Museum, in Blythe, houses information on the history of the region, focusing heavily on the development of the Blythe community, as well as a comprehensive collection of local periodicals.

AECOM also performed other archival research, including the examination of historic topographic maps including: *Chuckwalla Mountains* (1:50,000 scale, 1947); *Sidewinder Well* (1:62,500 scale, 1952); *Palen Mountains* (1:48,000 scale, 1943); and *Hopkins Well* 1:48,000, 1943). In addition, other historic maps were accessed online from California State University, Chico and the University of Alabama. Also reviewed were maps from the Malcolm Rogers collection on file at the Museum of Man in San Diego.

Staff executed additional archival research, visiting the University of California, Davis Shields Library.

Staff conducted additional on-line searches for historic maps depicting the project area. The following maps were examined:

- Beale (1861), Map of Public Surveys in California, Scale 1:1,140,000.
- American Photo-Lithographic Company (1865), California, Scale 1:5,069,000.
- Asher and Adams (1872), California and Nevada-South Portion, Scale 1:1,267,000.
- Williams (1873), Map of California and Nevada, Scale 1:3,485,000.
- Colton (1873), Colton's California and Nevada, Scale 1:2,091,000.
- Mitchell (1875), Map of the State of California, Scale 1:2,408,000.
- Hardesty (1882), Map of California and Nevada, Scale 1:2,000,000;
- Hardesty (1883), Map of Southeastern California, Scale 1:1,140,000.
- Rand McNalley (1884), California, Scale 1:2,028,000.
- Punnett Brothers (1897), Map of the State of California, Scale 1:2,218,000.
- Rand McNalley (1897), California, Scale 1:1,190,000.
- U.S. Geological Survey (1914), Lithologic Map of California, Scale 1:2,000,000.
- Smith (1916), Geological Map of the State of California, Scale 1:760,320.

Archival and Library Research Results

AECOM acquired historical data on the project vicinity, but identified no additional cultural resources in or near the project PAAs (Tennyson and Apple 2009). Staff accessed additional historical information from the University of California Davis library and documents available online.

Local Agency and Organization Consultation

California counties and cities may recognize particular cultural resources as locally historically important by ordinance, in general plans, or by maintaining specific lists. Consistent with the Energy Commission's Data Regulations, the original applicant and Energy Commission Cultural Resources staff contacted local planning agencies and historical and archaeological societies to acquire information on locally recognized cultural resources specific to the vicinity of the project.

Local Agency and Organization Consultation Results

AECOM received no responses from the various historical societies, museums, and research institutions contacted. As the project is located on BLM land, a Fieldwork Authorization Request form was filed and approved on March 10, 2009.

Local Historical Societies

California counties and cities may recognize particular cultural resources as locally historically important by ordinance, in general plans, or by maintaining specific lists. To facilitate the environmental review of their projects, applicants or owners acquire information on locally recognized cultural resources specific to the vicinity of their project by consulting local planning agencies and local historical and archaeological societies.

AECOM contacted various local historical societies, museums, and research institutions requesting information for the project footprint and surrounding area. The following institutions were contacted by both formal letter (dated June 1, 2009) and follow-up phone call (on July 17, 2009): General Patton Memorial Museum; Historic Resources Management Programs, University of California, Riverside; Palm Springs Historical Society; Palo Verde Historical Museum and Society; and Riverside County Historical Commission. AECOM also visited the Bureau of Land Management (BLM) office in Palm Springs was visited on May 4, 2009, in order to examine the General Land Office (GLO) plat maps for the PSEGS, desert land entries, and various survey reports.

AECOM received no responses from the various historical societies, museums, and research institutions contacted. As the project is located on BLM land, a Fieldwork Authorization Request form was filed and approved on March 10, 2009.

Native American Heritage Commission

The Governor's Executive Order B-10-11, executed on September 19, 2011, directs state agencies to engage in meaningful consultation with California Indian Tribes on matters that may affect tribal communities. Consistent with Executive Order B-10-11, the California Natural Resources Agency adopted a tribal consultation policy on November 20, 2012. The Energy Commission is a "department" within the Natural Resources Agency and is required to consult with tribes consistent with the Natural Resources Agency tribal consultation policy as well as Energy Commission regulation and policy. The Energy Commission Siting Regulations require applicants or owners to contact the Native American Heritage Commission (NAHC) for information on Native American sacred sites and a list of Native Americans interested in the project vicinity. The applicant or owner is then required to notify the Native Americans on the NAHC's list about the project and include a copy of all correspondence with the NAHC and Native Americans and any written responses received, as well as a written summary of any oral responses in the AFC (CEC Regs 2007:App. B(g)(2)(D):87).

The NAHC is the primary California government agency responsible for identifying and cataloging Native American cultural resources, providing protection to Native American human burials and skeletal remains from vandalism and inadvertent destruction, and preventing irreparable damage to designated sacred sites and interference with the expression of Native American religion in California and specifically regarding actions on private or state lands. It also provides a legal means by which Native American descendants can make known their concerns regarding the need for sensitive treatment and disposition of Native American burials, skeletal remains, and items associated with Native American burials.

The NAHC maintains two databases to assist cultural resources specialists in identifying cultural resources of concern to California Native Americans, referred to by staff as Native American ethnographic resources. The NAHC's Sacred Lands database has records for places and objects that Native Americans consider sacred or otherwise important, such as cemeteries and gathering places for traditional foods and materials. Their Contacts database has the names and contact information for individuals, representing a group or themselves, who have expressed an interest in being contacted about development projects in specified areas.

Both the project owner and staff requested information on the presence of sacred lands in the vicinity of the PSEGS project area, as well as a list of Native Americans to whom inquiries should be sent to identify both additional cultural resources and any concerns the Native Americans may have about the proposed project.

On behalf of the applicant for the PSPP, EDAW (since acquired by AECOM), contacted the NAHC on April 13, 2009, and requested a search of the Sacred Lands File and a Native American contacts list. The NAHC responded on April 20, 2009, with a list of Native Americans interested in consulting on development projects in the project area. Letters to tribes and individuals listed on the NAHC contact list were mailed or faxed by EDAW on July 8, 2009. Copies of the contact letters were provided in Confidential Attachments 3, 4 and 5 of the cultural resources technical report (Tennyson and Apple 2010) that informed the PSPP AFC. A detailed summary table of the results of consultations with the individual Native American organizations on the NAHC contact list was also included. EDAW received responses from the Cabazon Band of Mission Indians that indicated they had no comment on the project. Another response was received from Joseph Benitez stating that the Chemehuevi tribe should be contacted.

The record search of the NAHC Sacred Lands file conducted by EDAW did indicate the presence of Native American cultural resources on or within one half mile of the PSEGS site. However, the Sacred Lands file search conducted by staff of the PSEGS footprint did not indicate the presence of Native American cultural resources in the immediate project area. The reader should note that the Sacred Lands file only contains those resources that tribes are willing to publically identify and cannot be considered a comprehensive list of places and objects that Native Americans consider sacred or otherwise important. In addition, the NAHC inventory search provides requesters with presence/absence, but not specific locations and resources types or themes. It is expected that staff will continue to glean specific information from participating tribes as a result of continued research and consultation associated with BLM's PA and NHPA Section 106 compliance for the right-of-way approval process for PSEG.

Staff contacted the NAHC on February 12, 2013, and requested a search of the Sacred Lands File and a Native American contacts list. The NAHC responded in February 2013 with a list of Native Americans interested in consulting on development projects in the project area. On February 25, 2013 staff sent letters to all of the NAHC listed tribal entities, consisting of nine tribes, one tribal foundation and one tribal individual, inviting them to participate in a field trip to the proposed project area and encouraging tribes to provide additional cultural resources information to staff. BLM staff requested that the Energy Commission broaden consultation to tribes that the BLM understood to have a cultural interest in the project vicinity but that were not included on the NAHC list. Staff complied with the BLM request by sending out additional letters on April 3, 2013 to an additional six tribes. (See **Cultural Resources Figure 2** for general map of tribal government office locations and territories).

Native American Environmental Justice

Federal Environmental Justice (EJ) guidance directs agencies to consider to the extent practicable whether there is or will be an impact on the natural or physical environment that significantly (as employed by the National Environmental Policy Act) and adversely affects Indian tribes. Such effects may include ecological, cultural or social impacts on Indian tribes when those impacts are interrelated to impacts to the natural or physical environment. Agencies must also consider whether environmental effects are significant (as employed by the National Environmental Policy Act) and are or may be having an adverse impact on Indian tribes that appreciably exceeds or is likely to appreciably exceed those on the general population or other appropriate comparison group.

Staff considers the Indian tribes affiliated to the Chuckwalla Valley (through ancestral or traditional use claims) to constitute environmental justice populations. Staff makes this consideration because Indian tribes maintain long-standing ancestral and traditional use practices and concepts connected to the environment and to their identities as Indian people, unlike other populations that do not have territories linked to their collective identities.

Field Investigations

In support of the broader research effort to identify historical resources in a PAA, the Energy Commission's Data Regulations require applicants or owners to conduct field surveys to both relocate and identify cultural resources in or near proposed project areas, where prior surveys are more than five years old. These prescribed surveys include pedestrian archaeological surveys and built-environment windshield surveys. Additionally, staff may ask applicants or owners to undertake geoarchaeological investigations or conduct additional fieldwork to support CRHR eligibility evaluations of the archaeological resources present in a PAA.

As part of the original licensing AECOM conducted surveys to identify previously unrecorded cultural resources in the original PAA. These surveys include a pedestrian archaeological surface survey, a geoarchaeological subsurface investigation, and a built-environment windshield survey.

Pedestrian surveys of the project site were conducted in several stages:

- The main project footprint and originally proposed transmission line/substation siting was surveyed by AECOM April 13–May 6, 2009, and October 14–26, 2009 (Tennyson and Apple 2009);
- Portions of a new transmission line and transmission line alternative were surveyed by AECOM in May, 2010 (final report not yet available to staff[19]); and
- Other portions of the new and alternative transmission line routes, the new and alternative substation locations, and the alternative substation access road route were surveyed by ECORP for the Desert Sunlight Project (Staff has had access to DPR 523 series forms, but not the technical reports for these investigations; therefore, staff has not had critical information on investigation parameters.).

AECOM surveys were conducted using four-to-eight-person teams each led by a crew chief. These teams maintained transect-spacing of 20 meters or less. Identified sites and/or isolates were flagged and recorded, their positions determined with handheld global positioning system (GPS) units. An arbitrary distance of 50 meters between artifacts and features was used to create boundaries between individual sites. Sites were defined as four or more artifacts within a boundary; isolates were defined as three or fewer artifacts. Temporary recording forms were completed in the field as the sites and isolates were identified, and additional intensive survey was conducted with three-meter intervals to fully delineate site boundaries. Flags were removed immediately after recordation. Staff has no description of ECORP's field methods.

Cultural Resources Table 4 lists the field investigations staff used for the present analysis. The table includes pertinent investigations from the original siting case as well as a few of the investigations that staff has either requested of the project owner or done themselves in order to analyze the subject amendment. The field methods and results of the investigations that staff does have are detailed below.

[19] In early May, 2010, the BLM restricted all holders of BLM cultural resources survey permits, including the PSPP applicant and the Desert Sunlight cultural resources consultant, from providing data directly to the Energy Commission, due to concerns about what appeared to be differing regulations between the two agencies on restricting access to sensitive cultural resources data. The issue has since been resolved, but, as of the time of this writing, no formal mechanism for the transmission of confidential cultural resources data to the Energy Commission has yet been developed.

Cultural Resources Table 4
Completed Cultural Resources Inventory Investigations Relevant to the Analysis of the Amended Project

Investigation Type	Results	Report Reference
Geoarchaeological monitoring of geotechnical excavations	Gross, reconnaissance-level geomorphic framework proposed for the original project area	(Steincamp 2009)
Phase I geoarchaeological reconnaissance	Aerial and ground-based geomorphic analysis and development of a moderately high-resolution geoarchaeological context for the amended project area	(Nials 2013)
Intensive pedestrian cultural resources surveys of the facility site and ancillary infrastructure	Documentation of 1 historic structure, 9 prehistoric and 54 historical archaeological deposits	(Tennyson and Apple 2009)
Ethnographic Resource Study	11 Traditional Cultural Properties: 1. Palen Dunes/Palen Lake 2. Ford Dry Lake 3. McCoy Spring (CA-RIV-0132) National Register District 4. Chuckwalla Spring (CA-RIV-0262) 5. Corn Spring (CA-RIV-032) 6. North Chuckwalla Mountains Petroglyph District (CA-RIV-01383) 7. North Chuckwalla Mountains Prehistoric Quarry District (CA-RIV-01814) 8. Long Tank 9. Alligator Rock 10. Dragon Wash (CA-RIV-049) 11. San Pascual Well	PSEGS Field Visit and Final Ethnographic Report prepared by Energy Commission staff (July-August 2013).

Archaeological Field Investigations

Geoarchaeological Monitoring of Geotechnical Excavations

Geoarchaeological monitoring of a geotechnical investigation within the PSEGS archaeological PAA took place July 20–28, 2009 (Steinkamp 2009). Excavations of twelve boreholes and eight test pits were observed for presence/absence of paleosols, archaeological artifacts, or other evidence of archaeological deposition. Stratigraphic samples were collected for sedimentological and mineralogical data. Test pits, 1.5–3 meters deep, were placed in locations where deep footings or weight-bearing loads are

planned. No cultural resources were found, and no evidence of subsurface paleosols or cultural deposits were noted during the course of monitoring.

Observations of the surface topography and subsurface deposits from the test pits suggest that the site is dominated by a roughly 10–33-centimeter-thick veneer of soil (A-horizon)[20] formed in fluvial (re-worked alluvial fan deposits) and eolian (wind-deposited) sands and fluvial gravels originating from the Pleistocene alluvial fans of the surrounding mountain slopes. A-horizon soils consist of olive gray gravelly sand with sparse roots, sub-angular pebbles, angular blocky structure, and a clear wavy boundary. The C-horizon consists of a C1 horizon of storm couplets overlaying a C2 and C3 horizon of alluvial and dune sands, as well as alluvial gravels. Data from the borings indicate that the deeper subsurface deposits, below three meters, consist of alluvial fan sand and gravels that appear to represent alluvial fan transgression and aggradation, and clay that likely correlates to transgression of early lake deposits during glacial periods and stable phases of the coalescing alluvial fans.

Steinkamp concludes, on the basis of these observations, that the potential for buried shallow archaeological deposits is highest within the northeast quadrant of the original archaeological PAA, where wave-cut platforms of paleo-lacustrine and beach deposits were observed beneath dune deposits, less than a meter below the surface. Within the remainder of this PAA, if buried deposits are present, they are more likely to be deeper (up to 20 feet), due to the greater depth of alluvial fan deposition. Archaeological deposits at depth, within the alluvial fan deposits, have the potential to be heavily disturbed by millennia of alluvial fan transgression and erosion processes. Over the last 80 years, however, dikes, constructed on the upslope side of U.S. Route 60/70 in the 1930s, have protected this area by diverting storm water runoff (Steinkamp 2009, pp. 16–18).

Phase I Geoarchaeological Reconnaissance

In April-May 2013, Fred Nials conducted an aerial and ground-based geomorphic analysis and developed a moderately high-resolution geoarchaeological context for the amended PAA. This geoarchaeological assessment of the PSEGS had a number of objectives including:

- Determine whether Pleistocene/Holocene transition pluvial lakes existed in Chuckwalla Valley that may have influenced archaeological site distribution in or near the PSEGS area;
- Describe the geomorphic setting and dominant geomorphic processes responsible for the context of prehistoric sites;
- Evaluate the distribution, function, duration of occupation, and potential for dating of archaeological sites in and near the project area insofar as can be determined by site locations and geomorphic context;
- Evaluate the potential for intact buried sites; and

[20] Sedimentologists denote successively deeper soil layers with alphabetical letters, starting at the top with “A.”

- Recommend additional site treatment(s), if suitable, to protect cultural resrouces and maximize information return.

Intensive Pedestrian Cultural Resources Survey

AECOM, Applied Earthworks, and ECORP teams found 64 resources during their field investigations of various components of the PSEGS (the facility footprint, surrounding temporary disturbance area, access roads, transmission line, and substation footprint). These included one historic structure, nine prehistoric and 54 historic-period archaeological sites (Tennyson and Apple 2009, pp. 57–124; AECOM EDAW 2009a, pp. 15–17).

Prehistoric Archaeological Resources

Nine prehistoric sites were identified during field investigations within the different components of the project (facility footprint, facility access roads, temporary disturbance area, transmission line corridor, substation footprint, and substation access road); including five sparse lithic scatters and four sparse lithic and fire-affected rock (FAR) scatters (**Cultural Resources Table 5**).

Cultural Resources Table 5
Prehistoric Resources on the Proposed Facility Site

Site Ref. (SMP-P-)	Resource Type	Size (m)	Landform	Constituents	Other
1015	Lithic scatter	90x30	Gravel terrace	31 flakes & 2 cores (cryptocryst, metavolcanic, basalt, rhyolite)	Surficial
1016	Lithic scatter	45x25	Gravel terrace	7 flakes (cryptocryst, metavolc, basalt, quartz)	Surficial
1017	Lithic & FAR scatter	50x18	Deflated dune terrace	3 flakes (metavolcanic), quartzite hammerstone, piece ground stone, 60+ FAR frags	Possible subsurface deposit
1018	Lithic & FAR scatter	25x9	Deflated dune terrace	13 pieces metavolcanic debitage, 35 pieces FAR, metate frag	Possible subsurface deposit
2014	Lithic scatter	30x20	Dune	3 flakes & core (metavolcanic)	Possible subsurface deposit
2015	Lithic & FAR scatter	47x22	Dune at base of alluvial fan	40+ flakes (metavolc, cryptocryst), biface frag (basalt), domed scraper, core, 4 metate frags, 2 poss. metate frags, boulder with ground surface, and marine shell frag	Possible subsurface deposit

Site Ref. (SMP-P-)	Resource Type	Size (m)	Landform	Constituents	Other
2018	Lithic & FAR scatter	54x28	Deflated dune on periphery of Dry Lake	Five clusters of FAR (126 pieces of basaltic, metavolcanic, and granitic rocks), a metavolcanic primary flake, cryptocrystalline biface-thinning flake, a quartz secondary flake, a metavolcanic hammerstone/ battered cobble	Possible subsurface deposit
2023	Lithic & FAR scatter	75x16	Alluvial fan	2 flakes, core, 8 metate fragments, 1 mano, & 6 pieces of FAR	Possible subsurface deposit
MT-001	Lithic scatter	60x20		1 rhyolite core/chopper, 1 rhyolite tested cobble, and 1 rhyolite core	Historic component, mid-20th century can scatter and one screw-top glass bottle

Ethnographic Field Activities

Native American Consultation

Energy Commission staff held meetings with affiliated tribes to exchange general information and to gauge tribal interest in participating in further project-related ethnographic studies. Staff based their invitations to tribal government representatives and individual traditional Native American practitioners upon a February 13, 2013 list provided by the NAHC and a separate March 12, 2013 list provided by the BLM.

On March 22, 2013 a general meeting was held at the BLM Corn Springs campground and the PSEGS project site. Energy Commission staff, BLM staff, and cultural resources staff from the Colorado River Indian Tribes, Agua Caliente Band of Mission Indians, Morongo Band of Mission Indians, San Manuel Band of Mission Indians and the Soboba Band of Luiseño Indians attended. Topics discussed at this meeting included project details, interest in further project participation, and sharing contact information.

On May 20, 2013 a meeting was held at the Agua Caliente Band of Cahuilla Indians office in Palms Springs. Energy Commission staff, BLM staff, and cultural resources staff from the Agua Caliente tribe attended. Topics discussed at this meeting included project schedule, the draft ethnographic report, and tribal concerns.

On May 21, 2013 a meeting was held at the Soboba Band of Luiseño Indians office in San Jacinto. Energy Commission staff, BLM staff, and cultural resources staff from the Soboba band were present. Topics discussed at this meeting included project schedule, the draft ethnographic report, and tribal concerns.

On May 23, 2013 a meeting was held at the PSEGS project site near Desert Center. Energy Commission staff and cultural resources staff from the Fort Mojave Tribe attended. Topics discussed at this meeting included project details, project schedule, the draft ethnographic report, and tribal concerns particularly regarding the need for holistic landscape evaluations and why standard visual analysis is not adequate for understanding tribal landscapes.

On May 24, 2013 a meeting was held at the Quechan Indian Tribe office in Winterhaven, California. Energy Commission staff, the Quechan THPO, and the Quechan Cultural Committee were present. Topics discussed at this meeting included project details, interest in further project participation, the draft ethnographic report and tribal concerns. A Quechan Culture Committee member offered to provide expert witness testimony during the hearings for the PSEGS project should the need arise.

On June 20, 2013 a meeting was held at the Morongo Reservation. This meeting was a routine "all-Cahuilla" meeting. The PSEGS was one of several items on the meeting agenda. In addition to Energy Commission staff, cultural resources staff from the Morongo Band of Mission Indians, Torres-Martinez Desert Cahuilla Indians, San Manuel Band of Mission Indians, Soboba Band of Luiseno Indians and the Agua Caliente Band of Cahuilla Indians were in attendance. Staff's preliminary findings were discussed and it was announced that the Preliminary Staff Assessment was soon to be released.

On July 10, 2013 a meeting was held between the Quechan Tribal Council, Quechan Culture Committee and Energy Commission staff to explain the CEC regulatory process in general and as relates to the PSEGS. Specific cultural topics discussed were tribal "natural settings" and tribal methods for desert navigation and travel. The desire for the Quechan Culture Committee to provide an expert witness to support staff's testimony was further discussed.

The week of July 15th was spent in the Chuckwalla Valley conducting ethnographic resources assessments. All tribes were invited to participate and the Mojave Tribe and Quechan Tribe cultural resources staff participated in some of these field activities. Known sites were visited and several previously unknown sites were discovered. Ethnographic information was gathered concerning petroglyphs, natural settings and traditional methods for desert travel and navigation.

The week of August 12 was spent meeting with various tribes concerning multiple renewable energy projects, including the PSEGS. Meetings were held with the Colorado River Indian Tribes, the Quechan Tribe, the Fort Mojave Tribe and the Chemehuevi Tribe.

Ethnographic Study

Ethnographic Methods

Ethnography at its best takes years to complete. Ethnographers can spend a lifetime studying another culture and still find that their cross-cultural knowledge of their "second" culture is incomplete. Ethnography is generally a long-term endeavor lasting from several months to years. Ideally, one would spend one year studying another culture so that one can learn about the various seasonal variations and adaptations.

Academic and self-funded anthropologists may have such luxury. However, the merits of ethnography, when employed to understand project impacts to ethnographic resources, often require less than optimal study durations. One method, called "Rapid Cultural Assessment" was developed in the 1930s to assist sociologists' understanding of American rural agricultural community responses to socioeconomic impacts ensuring from evolving environmental conditions (NPS 2007, Chapter 10:8, http://www.iisd.org/casl/caslguide/rapidruralappraisal.htm).

The National Park Service (NPS) has developed similar methods for understanding ethnographic resources within shortened time frames related to project review. The NPS method, called Rapid Ethnographic Assessment Procedures (REAP), was generally followed for this project-related ethnographic study.

REAP consists of a selection of ethnographic methods that relies on interview, observation, and research techniques to describe a way of life common to a group of people. This way of life can include their knowledge, customs, beliefs, social habitats, technology, arts, values, and institutions; characteristics that contribute to the identification of TCPs (King 2003:134). REAP involves active participation of the people in a cultural group to render representations of a way of life from their point of view. Unlike traditional ethnography, REAP focuses investigations and resultant descriptions on solving specific problems or issues that may arise as a result of proceeding with a development project.

REAP's truncated methods include but are not limited to (http://www.nps.gov/ethnography/training/elcamino/phase1.htm#reap):

1. Group meetings/interviews where the ethnographer explains the project to the group, answers general questions and solicits immediate responses, fears and apprehensions, benefits, or other general perceptions from the participants concerning the project, the area where the project is being proposed, and the general connections of traditional people to the project area. Often issues of confidentiality are discussed. Surmounting the issues of confidentiality, the ethnographer may be successful in scheduling follow-up activities with specific individuals to increase ethnographic understanding.

2. Areas worth further ethnographic inquiry are identified; a research design, including research/interview questions, is developed; and specific people are scheduled by the ethnographer and the group for follow-up interviews. Follow-up interviews should be conducted according to the protocols of documentation and confidentiality identified during the group meeting/interview. Interview notes, however recorded, should be vetted with source individuals to verify accuracy and to gather additional nuanced information.

3. Follow-up interviews with the same or additional people often occur while both the ethnographer and the community begin to further think about the project, the project effects, and additional information that is necessary for fully identifying, evaluating, assessing effects, or otherwise considering impacts to ethnographic resources.

4. As Steps 1 through 3 are being conducted, a parallel archival "search, retrieve, and assess" process is undertaken to provide supporting or conflicting information to what is being discovered through the interview process. In addition to archive, book store, and other informational repositories (e.g., the Internet), the people themselves or other ethnographers with previous experiences with the same people may provide source materials.

5. Field visits will help the ethnographer triangulate between what people currently say, what people have written in the past, and what is actually or perceived by the ethnographer as a potential ethnographic resource in the project area.

Guidelines issued by state and federal agencies serve to direct the identification and evaluation of historical resources. The California Office of Historic Preservation (OHP) issued Technical Assistance Series #6 comparing the criteria and process for listing historic resources in the CRHR and NRHP. OHP acknowledged "the two programs are very similar" because the NRHP was used as the model for the CRHR. There are however no state level guidelines for the identification and evaluation of TCPs; therefore, practitioners in California defer to the federal guidelines found in National Register Bulletin 38 (Parker and King 1998).

Research Strategies

Energy Commission staff developed research strategies based upon the results of early meetings with tribes and previous ethnographic studies conducted by Energy Commission staff in the region. Staff identified the ethnographic project area of analysis to be the same as the view-shed delineation area identified by the Owner (Fleming 2013). This figure (see **Cultural Resources Figure 1**) describes an area within an approximately 15 mile radius of the PSEGS facility.

The Prehistoric Trail Network Cultural Landscape (PTNCL) passes through the project area. This trail corridor was identified in the Staff Assessment written for the PSPP, and Condition of Certification **CUL-1** was applied to reduce the cumulative effects of three utility-scale solar energy facilities located in Chuckwalla Valley and the Palo Verde Mesa. Staff's knowledge of the PTNCL helped to inform the data requests and research strategies by providing a context upon which these requests and questions could be asked. For example, knowing that the PTNCL passes through the project area suggests that several tributary trails passed within close proximity to the PSEGS project area connecting to the larger trail network and also potential places of ethnographic significance. By understanding these trail networks, staff realized that they had a unique opportunity to make likely assumptions as to where potential resources or trails could be. As staff consulted with tribes and considered the PTNCL concept in relation to the Chuckwalla Valley, it became apparent that the trails network was much larger than the originally cast landscape concept that only placed emphasis on an era when the Halchidoma were in primary control and usage of the trail and that the boundaries of the PTNCL were arbitrarily cut off at Chiraco Summit to the west of Chuckwalla Valley and arbitrarily cut off to the east of Chuckwalla Valley at the eastern bluff of Palo Verde Mesa (See **Cultural Resources Figure 3**). Staff realized that a larger trail landscape more appropriately provided an avenue for understanding human migration and settlement of the Americas. Staff has named this landscape, somewhat consistent with other anthropologists who worked in the region, as the Pacific to Rio Grande Trails

landscape (PRGTL) (Bean et al. 1978:5-1; Singer 1984:38, Sample 1950, Davis 1961, Erlandson 2012) (**Cultural Resources Figure 4**). The larger trails landscape accommodates three trail corridors from the Southern Pacific Coast of California, across the desert regions of Southern California, across the Colorado Plateau of the Southwest to the Northern Rio Grande Valley in what is now New Mexico. Along these three trail corridors other trail networks linked to provide travelers with access to California's Central Valley, Baja California, the Owens Valley and Eastern side of the rugged Sierras; the Southern Great Basin, mainland Mexico, the Rocky Mountain regions, the High and Great Plains and ultimately the Mississippi River Valley.

Staff, while realizing the vastness that such a trail system provides and the predictive power that such landscape research can yield for some of the most vexing problems of North American Anthropology, including understanding indigenous settlement and migration, remained focused on the middle corridor that generally, in braided fashion, runs through the Chuckwalla Valley.

The research strategies provided general guidance for preliminary archival research and allowed for the preparation of interviews. Because this analysis is focused on the changes from the originally licensed project to the currently proposed PSEGS facility, the primary focus of this research design is on the direct visual effects to the setting, feeling and association of ethnographic resources collectively understood within the context of the Chuckwalla Valley portion of the PRGTL.

Research questions and directives developed included, but are not limited to:

- Research specific Chuckwalla Valley and neighboring regions (Lower Colorado River Valley, Coachella Valley) Native American history and culture to establish potential places of ethnographic significance that are located within the ethnographic PAA. Such places can be, but are not limited to; springs and other sources of water, rock art panels, habitation sites, and ceremonial sites.
- Research contributing elements to TCPs. This list of elements is based on previous research Energy Commission staff conducted in the region, and includes but is not limited to:
    - Amity/Enmity Relationships among tribes
    - Trails
    - Water
    - Totemic Clan names
    - Subsistence
    - Plants and Animals
    - Ceremonies
- Research the role of medicine men and rock art to better understand the relationships among rock art sites in the Chuckwalla Valley.
- Research how the various identified ethnographic resources can be synthesized into the PTNCL.

- Inquire as to the relationships between the Mohave, Chemehuevi, Quechan, Cahuilla, and Serrano cultures and the potential places of ethnographic significance.
- Inquire as to the extent that the PSEGS solar power tower negatively impacts the integrity of these ethnographic resources.

Interviews

Staff conducted limited ethnographic interviews after completion of most of the archival research. The abbreviated nature and fast-paced schedule of the amendment process did not afford the opportunity to establish full and complete interview sessions with designated tribal representatives prior to publication of the FSA. However the interviews that were completed occurred in the field and were extremely productive and pertinent to the Native American values related to the Chuckwalla Valley and surrounding environs.

Ethnographic Method Constraints

It is important to acknowledge several constraints staff has identified to the ethnographic methods. The purpose of acknowledging these constraints is to allow the reader and decision-makers to understand how this ethnographic effort may fall short of a more complete ethnographic analysis. By identifying constraints early in the process staff is also able to strategically surmount some constraints. These consist of issues of confidentiality, time, language, access to private land, and missing data. Constraints were categorized as *surmountable*, *partially surmountable*, or *insurmountable* as described below.

Tribal answers to research questions can be sensitive, and tribes attach a high degree of confidentiality to such information. As such, these confidentiality concerns require more coordination and a lengthier schedule for completing the ethnographic study and subsequent report than other technical studies. In particular some tribes, particularly the CRIT require an application for all ethnographers who desire to interview CRIT tribal members. Staff is currently drafting a CRIT Permit Application that, upon signature of CRIT and Energy Commission, would allow staff to conduct ethnographic interviews with tribal members on an on-going basis. However, because the cultures represented within the CRIT tribal membership are also represented by other tribes consulted for this project, some cultural information was still obtained. In addition the Soboba Tribe also has concerns about confidentiality and any Soboba interviewees would require tribal council designation. Limited document review and comment was provided by the Soboba Cultural Department. *Constraint partially surmounted*.

Time limits imposed by the Energy Commission amendment process are another constraint. The Mohave, Chemehuevi, Quechan, and Cahuilla cultures, and traditional cultural practices related to epistemology, world view, and religion, are too complex to understand within the limits of a six month study. The Rapid Ethnographic Assessment Procedures were adapted to this ethnographic study. While REAP cannot replace the quality that comes from full indigenous knowledge gathered in long-term ethnographic endeavors, REAP does provide some ability to include ethnographic resources in the Energy Commission amendment process; a process that only affords Energy Commission staff with a few to several months to conduct independent research. *Constraint partially surmounted*.

Language barriers and differences in world view can make ethnography challenging. Some cultural practices and understandings are foreign to the English language and scientific way of knowing, and can only be articulated in the traditional languages of Native Americans. Staff does not speak or understand any of the languages traditionally spoken by the Mohave, Chemehuevi, Quechan, Cahuilla, or Serrano. Additionally, in past ethnographic studies conducted by Energy Commission staff with some of these tribes, concerns were expressed about the ability of new forms of language (i.e., English and Western-based science) to express the tribes' deep seeded understanding of their cultural places. Staff did work, where invited, to go through intermediaries that made proper introductions to knowledgeable tribal people. However, information conveyed in this report is provided in the English language only. *Constraint partially surmountable.*

The San Pascual well is located on private land. The dominant feature of this area is a large wash emanating from the Pinto Basin and fed by washes emanating from the Coxcomb and Eagle Mountains. The well was likely constructed within or in very close proximity to the wash because water is more likely to be closer to the surface in a wash. However, the wash itself and the area around the wash are privately owned. Therefore, staff was unable to examine what is extant of the well, compromising staff's ability to assess the site. *Constraint not surmounted.*

Due to time constraints the trail study requested of the Owner (Data Requests 29, 30, 31) was provided to staff on August 12, 2013, a few weeks prior to document deadlines and therefore was not fully utilized. However, a discussion of trails is included in this assessment based on the archival research conducted thus far for other area projects, from what has been produced for the PTNCL, and tribal knowledge of trails. However, the trail data received as fulfillment of data request 29, 30, and 31 confirmed what staff had independently assessed from other data sets. *Constraint partially surmounted*.

Also due to time constraints, a reconnaissance archaeological/ethnographic survey requested of the Owner (Data Request 27), which would have required BLM and NPS permitting, to be conducted along the flanks of the Palen and Coxcomb Mountains in those portions of the mountains in the view-shed of the proposed project facilities did not occur. Staff did conduct a limited reconnaissance of one location in the Coxcomb Mountains and two locations in the Palen Mountains. Additional ethnographic and archaeological sites were located. The limited reconnaissance did confirm that staff's Data Request 27 was warranted. *Constraint not surmounted.*

Preliminary Results of Ethnography

Staff Ethnographic Archival Efforts

Staff made efforts to seek, obtain, and assess culturally relevant information from various archival and other sources. These sources include:

- Documents were obtained via various internet searches and subsequent downloads
- Books were obtained from online book stores
- Books and manuscripts from the California State Library
- Books and manuscripts from the Sacramento State University Library

- Books and manuscripts from the University of California Berkeley George and Mary Foster Anthropology Library
- Books and manuscripts from the University of California Bancroft Library
- Archaeological site records and reports from the Eastern Information Center at the University of California Riverside
- Archaeological site records and field notes collected by Malcolm Rogers, housed at the Museum of Man in San Diego
- Archaeological field notes collected by Alan Koloseike, housed at the Fowler Museum at the University of California Los Angeles

Places Analysis

Preliminary tribal meetings suggested that understanding the general cultural background of the Native American groups in the area would help to better inform staff's analysis of potential TCPs by providing context to these resources. Therefore, staff conducted ethnohistoric and anthropological research in an effort to better understand the cultural milieu in which these groups evolved and came to be who they are today, and potential ways of understanding how TCPs fit into the Chuckwalla Valley trail corridor and the encompassing landscape.

Ethnographic Resources

While several definitions of ethnographic resources can be found in historic preservation literature, the National Park Service provides the most succinct and commonly used definition (NPS 2007: Chapter 10):

> Ethnographic resources are variations of natural resources and standard cultural resource types. They are subsistence and ceremonial locales and sites, structures, objects, and rural and urban landscapes assigned cultural significance by traditional users. The decision to call resources "ethnographic" depends on whether associated peoples perceive them as traditionally meaningful to their identity as a group and the survival of their life-ways.

The term ethnographic resources can include resources that are also referred to as traditional cultural properties, sacred sites, cultural or ethnographic landscapes, heritage resources, historic properties, or historical resources that are sites, areas or places.

Traditional Cultural Properties/Places

Traditional Cultural Properties (TCPs) were defined in order to provide a layer of meaning, relevancy, or significance from a communal or localized perspective to the cultural resources profession that is otherwise dominated by archaeology and the knowledge and perspectives that archaeologists promote (King 2003: 21-33). Thomas King and Patricia Parker authored an innovative and influential National Park Service Bulletin (NPS Bulletin 38) that defined what TCPs are, how to understand, locate and document TCPs, and how to ethnographically interact with communities that wish to participate in the protection of their special places. An explanation of "traditional cultural significance" is provided in the following quote from NPS Bulletin 38 (Parker and King 1998: 1):

> "One kind of cultural significance a property may possess, and that may make it eligible for inclusion in the Register, is traditional cultural significance. "Traditional" in this context refers to those beliefs, customs, and practices of a living community of people that have been passed down through the generations, usually orally or through practice. The traditional cultural significance of a historic property, then, is significance derived from the role the property plays in a community's historically rooted beliefs, customs, and practices."

Such places of traditional cultural significance can include: a location that a Native American group associates with their traditional beliefs concerning their origins, cultural history, or nature of the world; the buildings, structures, or patterns of land use that reflect the cultural tradition valued by the long-term residents of a rural community; a cultural group's traditional home in an urban environment that reflects its beliefs and practices; a location where ceremonial activities conducted by Native American practitioners have historically, or are known or thought to have occurred; or, a location where the economic, artistic, or other cultural practices that are important in maintaining a community's historic identity have traditionally been carried out (Parker and King 1998: 1).

Thus, a property that is eligible for inclusion in the National or California Registers because of its association with cultural practices or beliefs of a living community that "(a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community is a traditional cultural property" (Parker and King 1998: 1).

While the TCP definition provided in NPS Bulletin 38 addresses many types of special places, some confusion exists with language added during the 1992 amendments to the NHPA at Section 101(d)6. This section says that "properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization may be determined eligible for inclusion on the National Register." The section further extols agencies to consult with Indian tribes and Native Hawaiians concerning the values that their communities may attach to special places. This has led some to erroneously interpret the Act's Section 101 language to limit TCPs to only Native Americans and Native Hawaiians. However, the specific language of the act does not prohibit diversity beyond the two specific ethnicities called out; but rather affirms that Native Americans asserting TCPs during the Section 106 process must be considered.

Staff considers the term "Sacred Site" to be different than the term "Traditional Cultural Property", although they are often used interchangeably, even when it is erroneous to do so. The term Sacred Site comes from the American Indian Religious Freedom Act (AIRFA), the Religious Freedom Restoration Act (RFRA), and Executive Order 13007. Without elaborating further on information concerning the history and resulting inter-relation of the acts and the order, suffice to say that Executive Order 13007 provides the best guidance and definition of the term "Sacred Site". Executive Order 13007 calls for the Federal government to accommodate access to, and ceremonial use of, Sacred Sites by Indian religious practitioners and to avoid adversely affecting the integrity of Sacred Sites through federal land manager actions (ACHP 2002). The definition is as follows:

> "…any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, an Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site."

Therefore, these two terms are not interchangeable because Sacred Sites can only be located on Federal lands and the definition calls out the limited geographic extent of Sacred Sites as "specific, discrete [and] narrowly delineated." However, TCPs are often identified as a result of Federal undertakings and tend to be geographically more expansive than "specific, discrete and narrowly delineated Sacred Sites." TCPs tend to be larger because aspects such as view-shed and changes through time need to be considered when defining the boundaries of a TCP (Parker and King 1998: 20)

For the purposes of this study, the research focus is with Native American sites, places, and areas otherwise referred to as ethnographic resources, located in and around the proposed project area. Having said this, and based upon the discussion provided above, the reader should be aware that there are multiple overlaps of terminology. Staff will primarily use the term "places" or "areas" in reference to the type of historical resources discussed in this report; however, where applicable staff will use the term that a source document or tribal participant uses. Places and landforms can be part of a cultural system. For example, Native Americans often consider mountain peaks, rivers, springs, and seeps to be important or sacred places. The following list of places includes those areas which are understood to have potential cultural significance for tribes in the vicinity of the PSEGS project area and therefore should be evaluated as possible ethnographic resources. These places have been derived from topographical maps of the region, as well as from published sources (i.e., Bean et al. 1978, Kroeber 1976, and Laird 1976). They are discussed geographically beginning with the Palen Dunes/ Palen Lake ACEC and moving in a clockwise direction around the PSEGS ethnographic PAA. **Cultural Resources Figure 5** provides a map with the places depicted in a geographic context.

Based upon initial tribal consultations and archival research, the following is a list and descriptions of the 11 Traditional Cultural Properties identified in the Chuckwalla Valley trail corridor:

1. Palen Dunes/Palen Lake

   The Palen Dunes/Palen Lake area is a BLM designated Area of Critical Environmental Concern (ACEC) for the sensitive cultural resources located in the boundaries of the ACEC. The Palen Dunes/Palen Lake area is a resource identified by staff. It is located in the PSEGS ethnographic PAA about 3.5 miles north of the proposed project area. This potential ethnographic resource includes the 3,632 acre Palen ACEC, which also includes some of the dunes on the alluvial terrace of the Palen Mountains and the dry lake bed of Palen Lake, as well an additional approximately 500 acres of dunes north, west, and southwest of the ACEC. The key components of this area are the ancient Indian archaeological sites located in the dunes and on the margins of the dry lake bed, and the resources that were available to groups when water was present in the lake bed.

As mentioned previously, Palen Lake was an area that held ephemeral sources of water after significant rainfall events. This habitat provided a place for ancient Indian people to periodically obtain water and food resources, and evidence of their occupation of this lake habitat is indicated by several archaeological sites which have been documented along the shoreline of the lake, especially in the dunes (Ritter 1981). A geoarchaeological analysis by Nials (2013) suggests that Palen Lake does not exhibit the geologic characteristics that would indicate groups could have established anything more than temporary encampments because the lake only maintained ephemeral water sources.

The archaeological sites identified in the dune areas and along the margins of the lake identified in the Palen Dunes ACEC documentation (Ritter 1981) corroborate the suggestion that use of the lake and dune area was likely on a temporary basis. Artifacts identified include hearth features indicated by clusters of burnt (fire-affected) river cobbles, materials for making and maintaining stone tools, pottery sherds, a tortoise shell pendant, animal bones, and implements for grinding food (i.e., manos and metates)(Ritter 1981). The indications for short-term occupation of the area are suggested by the paucity of cultural remains and the sparse density of the artifacts (Ritter 1981:7). The activities which occurred likely included: gathering and processing mesquite and Palo Verde beans; gathering and processing grasses and other hard seed plants; hunting of rabbit, tortoise, and mountain sheep; cooking and consuming plant food resources and water; stone tool maintenance; and short-term camping (Ritter 1981:7-8).

In addition to those sites identified by Ritter (1981), at least 16 other archaeological sites have been identified in the area. Most of these sites occur to the west and southwest of the dry lake bed, and several are clustered around mesquite dunes. These sites primarily represent campsites and consist of lithic debitage, ground stone tools, ceramics, burned and unburned bone, fire-affected rocks, and hearths. Several of these types of sites were identified by staff during field visits to the area.

There are reports of ancient Indian era cremations at these sites as well. Site CA-RIV-201 (Rogers' designation C-82A, Koloseike Area A) was initially recorded by Malcolm Rogers at some point in the early 20th century as a large village site with a cremation area, ceramics, milling equipment, and many small projectile points (Singer 1984:45). Rogers' notes and site records were obtained from the Museum of Man, but there is no mention of cremations. However, Alan Koloseike re-examined the site in the early 1960s and did indicate the presence of a cremation (UCLA 2013). Another cremation was reported at CA-RIV-660 by Chester King in 1964, but Wilke (1973) suggests that the cremation may have been mistaken for what he identified as tortoise bone and shell fragments.

Little chronological information about these sites is available. Pottery was identified at multiple sites. Some of the pottery sherds were identified as Tizon brownware, another, a sherd of the Parker series. This suggests a date of A.D. 1000 to post 1500 (Waters 1980:1). Additionally, a projectile point collected during the Ritter (1981) survey was identified as a Rose Spring point. These projectile points date to about A.D. 200 to 1100 (Sutton et al. 2007: 236, table 15.4). There is an indication that some of the lithic flaking technology present at CA-RIV-697 may represent that

of Paleo-Indians (12,000 to 8,000 years ago) (Davis and Taylor 1978), but this has not yet been confirmed. However, a projectile point identified as a Clovis point was found about 15 miles east of RIV-697 (Rondeau 2012), suggesting that Paleo-Indians were present in the Chuckwalla Valley. While the archaeological evidence suggests that this area was occupied during Late Prehistoric times, dune areas are not always reliable indicators of all of the artifacts at a site. Sand dunes frequently shift from aeolian processes, and can easily obscure and/or uncover artifacts.

Dune areas in the southern California deserts provide habitat for several plant and animal species which are especially important for Native American groups. The Palen Dunes area provides low to moderate potential for Desert Tortoise habitat (PSPP FSA 2010:C.2-1 – C.2-2), an animal species that has significance for all of the tribes of concern. Dunes are also habitat for other plant and animal species which are significant to Native American groups.

Places that have been occupied by the descendants of contemporary Native American peoples are considered culturally important. Regardless of the duration of occupation at the Palen Dunes and Lake, descendants of contemporary Native Americans were present here, and their presence indicates a culturally sensitive location for contemporary Native Americans. In the Bean et al. (1978:7-7) study, researchers found that Palen Lake was an area of concern for tribal groups. Moreover, Russell et al.'s (2002:49) study of the Imperial Sand Dunes indicated that members of the CRIT regard dune areas as important because in the past dunes were used to bury the dead, and "in Numic culture, starting around the Salton Sea, Twentynine Palms area, there is a belief that powerful little medicine people make the sand dunes their habitat. It also houses water babies, who are also powerful." While these concerns have yet to be expressed by any tribes with regard to the Palen Dunes, it is reasonable to assume that similar concerns about the Palen Dunes area are held by tribes. Interviews with Mohave members in the Russell et al. (2002) study concerning the Imperial Sand Dunes indicated that dunes are important because they "sing". The "singing sands" are a well-known phenomenon that occurs when wind-blown grains of sand rub together making an audible noise. The Mohave indicated that references to singing dunes are mentioned in Mohave history and songs (Russell et al. 2002:56). Interviews with Cahuilla tribal members suggest that they regard dune areas as mysterious. The mysterious quality of dunes comes from the fact that the wind is constantly changing the dunes, and the role of wind in the larger landscape connecting mountains and valleys (Russell et al. 2002:64).

2. Ford Dry Lake

Ford Dry Lake is located about nine miles east of the PSEGS project area, in the Chuckwalla Valley south-southeast of the Palen Mountains and south-southwest of the McCoy Mountains. Ford Dry Lake is similar to Palen Lake because these are both locations that contained water in the past; however, there are no extensive dunes which surround Ford Dry Lake. Geoarchaeology fieldwork conducted for the PSEGS project concluded that from the Late Pleistocene/Early Holocene, Ford Dry Lake (and Palen Lake) were only ephemerally present (Nials 2013:21). Like the sites represented around Palen Lake, the archaeological sites that surround Ford Dry Lake suggest occasional, short-term plant and animal gathering and processing camps, or overnight camps by groups moving through the Chuckwalla Valley.

Although there are a larger number of sites recorded around Ford Dry Lake than there are around Palen Lake, this does not necessarily mean Ford Dry Lake was more densely occupied. A larger frequency of recorded sites could also be explained as a product of survey sampling bias.

Artifact assemblages at the sites around Ford Dry Lake typically include lithics and lithic debitage (which includes the materials for making stone tools, waste products from making stone tools, and stone tools themselves), groundstone tools (for processing plant foods), fire-affected and fire-cracked rock (indicating hearths used for processing resources), and ceramics. Several of these sites contain diagnostic artifacts, i.e., artifacts that can be assigned to a specific time period based on a chronology developed for the region. Table 6 indicates those sites which have diagnostic artifacts, what those artifacts are, and the time period (or periods) that the site may represent.

Cultural Resources Table 6
Archaeological Sites with Diagnostic Artifacts In the vicinity of Ford Dry Lake

Site Number	Diagnostic Artifacts	Time Period
CA-RIV-0663 (P-33-0663)	Parker Buff & Tizon brownware; Corner-notched projectile point	A.D. 1000 to post 1500
P-33-01818	Tumco Buff	A.D. 1000 to 1500
P-33-02157	Tizon brownware	A.D. 1000 to post 1500
P-33-03801	Parker Buff	A.D. 1000 to post 1500
P-33-03808	Tumco red-on-buff	A.D. 1000 to 1500
P-33-03809	Tumco Buff	A.D. 1000 to 1500
CA-RIV-06170 (P-33-08655)	Rose Spring projectile point	A.D. 200 to 1100
CA-RIV-09067 (P-33-017451)	Desert side-notched projectile point	A.D. 1100 to Contact
CA-RIV-09072 (P-33-017456)	Rose Spring projectile point	A.D. 200 to 1100
CA-RIV-09084 (P-33-017468)	Olivella shell bead	A.D. 1100 to Contact (GSEP FEIS appdx. ?)
CA-RIV-09220 (P-33-017789)	Cottonwood leaf-shaped projectile point	A.D. 1100 to Contact
P-33-01131	Tizon brownware	A.D. 1000 to post 1500
CA-RIV-09224 (P-33-017793)	Desert side-notched projectile point	A.D. 1100 to Contact

Like the occupation sites at Palen Lake, these are culturally important resources for Native Americans. Bean et al. (1978:7-7) also found that Ford Dry Lake was an area of concern for tribal groups. Ongoing consultations regarding discoveries related to Genesis solar projects attest to tribal importance related to archaeological resources.

3. McCoy Spring (CA-RIV-0132)

   McCoy Spring is located approximately 15 miles east of the project area at the western base of the McCoy Mountains. The proposed PSEGS would be in the line of sight of this NRHP-listed district, which encompasses over 30 acres.

   One of the most notable features at McCoy Spring is the extensive petroglyphs, one of the largest concentrations in the Colorado Desert. There are over 700 boulders with at least 1,000 individual petroglyph elements, including abstract designs, geometric designs, and anthropomorphic digitate figures (McCarthy 1986, Reed 1981:2). Design elements representative of the Great Basin Engraved variant are present at the spring, which includes curvilinear forms (the most prevalent), plain circles, circles with central dots, circles with connecting bars, assemblages of circular elements, sets of concentric U or V-shaped forms, curvilinear meanders, wavy lines, dot patterns, grids, cross-hatching, and maze-like patterns (Reed 1981:8). At least 12 digitate anthropomorphic human figures are located at McCoy Spring (Reed 1981:3). The petroglyphs at McCoy Spring exhibit varying degrees of re-patination, indicating that these petroglyphs range in age over several thousands of years. That is, rocks exhibiting more patina are older, relatively, than rocks with no or less patina because it takes many years for patina to accumulate. Absolute dating of petroglyphs is still in the experimental phases (e.g., Dorn et al. 1992; Lyttle et al. 2008) and no dating of the petroglyphs at McCoy Spring has taken place thus far. Therefore, the variation of patina on the petroglyphs suggests that the site was occupied over a long period of time, and it continues to be a site of importance for Native Americans into the Late Prehistoric Period and up to the present.

   In addition to petroglyphs, archaeological features located at the spring include midden deposits with associated ceramics, groundstone tools used for grinding food, and flaked stone tools and debitage.

   It should be noted that numerous trails from the north, west, and south lead to McCoy Spring, and from here, radiate out to other culturally important locations such as Corn Spring. The trail network connected these culturally important places in both a real and metaphysical sense. Along those trails in close proximity to McCoy Spring are cleared circles. Cleared circles have been interpreted to have several different functions (see Apple 2005; Bullard et al. 2008), both secular and sacred. This archaeological evidence indicates that McCoy Spring was occupied on a relatively frequent basis, likely by groups travelling through the Chuckwalla Valley.

   Springs are especially important features for Native American groups. They provided places for groups to rest and replenish, and their importance to ancient Indians is indicated by the vast number of petroglyphs often found at important springs. Rock art and trails, both of which are prevalent at McCoy Spring, are areas of concern for Native Americans when they have to potential to be impacted, directly or indirectly

(i.e., impacted visually) (Bean et al. 1978:6-14 - 6-15, 6-24 – 6-27, 6-39 – 6-40, 6-52, 6-53 – 6-55). Additionally, as noted in the rock art section above, it is generally accepted that rock art are loci of religious activity and are understood to represent the activity of medicine people. Because of the religious connection Native Americans have with rock art, rock art sites are important resources for contemporary Native American groups.

4. Chuckwalla Spring (CA-RIV-0262)

   Chuckwalla Spring is located in the southeastern portion of the Chuckwalla Mountains, about 13 miles south of the PSEGS project area. The boundaries of the site are situated such that portions are on the north face of the mountains, and therefore the solar power towers from the PSEGS would likely be visible from here. The most recent site form for this site is from 1978, and consequently little contextual information is available about the site from these early, brief descriptions.

   There are indications that Chuckwalla Spring was occupied as a village site, likely on a non-permanent basis, but most likely when the Colorado River seasonally overflowed its banks and groups retreated onto the mesa until the floods subsided (Bee 1963: 209, Castetter and Bell 1951: 70). Site forms suggest a high likelihood for petroglyphs at the site, in addition to trails, ceramics, lithics, and hearths extant at Chuckwalla Spring. This spring's location at the southern end of the Chuckwalla Valley suggests that it was useful for those travelling through the Chuckwalla Valley to the north, but also for those taking the route south of the Chuckwalla Mountains, what historically were portions of the Bradshaw Trail.

5. Corn Spring (CA-RIV-032)

   This National Register listed site is a spring located in the Chuckwalla Mountains, about 6.75 miles southwest of the PSEGS project area. The PSEGS solar power tower would not be in the direct line of sight of Corn Spring, but this is one of the most important resources for Native Americans in the Chuckwalla Valley. Moreover, there are several ancillary components to the Corn Springs site, including trails, cleared circles, and other trail features just outside of the canyon that are in the direct line of sight of the project. As such, staff considers this place to be a possible ethnographic resource that should be evaluated for project impacts.

   The most prominent feature of Corn Spring are the over 600 petroglyphs on 32 separate panels in 11 different concentrations located on rock outcrops surrounding the spring. Like most of the other petroglyphs in the area, these have been classified as the Great Basin Engraved variant, with the curvilinear style predominating. Design elements that have been identified include circles, assemblages of circular elements, curvy lines, U-shaped or semi-circular forms, dot patterns, cross-hatching, possible rain fringe, crosses, and circles with connecting bars. The petroglyphs exhibit varying degrees of re-patination, indicating a relatively long history of use and knowledge of the area by Native Americans. Like those petroglyphs at Mule Tank, Whitely (1996:109) suggests that the petroglyphs at Corn Spring represent the vision quests of medicine people or initiates.

Corn Spring was one of the most reliable sources of water within 20 miles of the spring (Fenenga 1981:13), and the archaeological evidence supports that this area was regularly occupied over several thousand years. In addition to water, food in the form of mesquite beans and edible seeds was easily obtained at the spring, and as mentioned previously, miners in the early 20th century indicated that corn grew up around the spring, no doubt having been planted by Native Americans years before (Gunther 1984:136). The spring not only attracted people, but animals as well, and groups set up hunting blinds along known animal trails into the spring. Other archaeological elements at the spring include trail segments, ceramic scatters, cleared circles, lithic debitage, bedrock mortars, and milling slicks.

As mentioned, rock art sites are especially important resources for Native Americans because of the religious connotations associated with medicine people and vision questing.

6. North Chuckwalla Petroglyph District (CA-RIV-01383)

The North Chuckwalla Petroglyph District is located in the northeastern portion of the Chuckwalla Mountains, about 4.5 miles west of the PSEGS project area, and about 5 miles east of the Alligator Rock geologic feature. Although the site was not officially recorded until 1979, the proximity of the site to a widely travelled corridor (i.e., the PTNCL and the U.S. 60/I-10) suggests that it was probably well known before it was formally recorded. The PSEGS solar power tower would be located in the direct view-shed of this NRHP-listed petroglyph district.

This site consists of 158 panels of petroglyphs in five loci, and the stylistic elements are similar to those at Corn Spring (Hedges 1980:15). On the 158 panels, there are 92 identifiable design elements, which include curvilinear designs, rectilinear designs, representational elements and various combinations of these designs (Hedges 1980: 13). There are also several glyphs which are not discernible elements, but rather seemingly random peckings, a feature unique to this site. Interestingly, on one of the boulders on which petroglyphs are pecked (Locus B) it was noted that a metallic ringing sound occurred when struck with a rock (Hedges 1980:26). The general orientation of the petroglyphs is to the southwest; almost all north and east facing surfaces are bare of petroglyphs. Hedges (1980:21) suggested that this may be related to the orientation of the wash which comes out of the mountains in a northeast direction, but there is no evidence to suggest any obvious connection to a celestial body.

The petroglyphs at the North Chuckwalla Petroglyph district, like those from Corn Spring, Mule Tank, and McCoy Spring, likely represent the work of medicine people or initiates. The petroglyphs at this site exhibit varying degrees of re-patination; some glyphs appear relatively new or recently re-pecked, while others appear older with significant patina over the glyph.

Other elements present at the North Chuckwalla Petroglyph District include rock rings, trails, flaked stone debitage, bedrock milling features and groundstone artifacts, temporary camps, ceramics, and cleared circles. One of the Native American observers (Chemehuevi) during the Devers-Palo Verde transmission line survey suggested that one of the particularly large cleared circles was a crying or

mourning circle, and likely was associated with Chemehuevi travel songs (Westec 1980:192).

As mentioned, rock art sites are especially important resources for Native Americans because of the religious connotations associated with medicine people and vision questing. The significance of this site to Native Americans is further emphasized by the presence of the crying or mourning circle that was identified.

7. North Chuckwalla Mountain Quarry District (CA-RIV-01814)

   The North Chuckwalla Mountain Quarry District is located in the Alligator Rock ACEC, about 2 miles east of the Alligator Rock feature. The district encompasses about 480 acres centered on an igneous rock feature which was the source of most of the quarrying material. The site was first recorded by the cultural resources survey for the Devers-Palo Verde Transmission line in 1979/1980, and nominated to the NRHP the following year. The site is especially important for understanding ancient Indian lithic tool procurement and manufacture. One material in particular, aplite a fine-grained felsic rock, is found throughout the quarry site, and was especially desirable for its fracturing qualities (Eckhardt et al. 2006:5). Evidence for an emphasis on the block-on-block manufacturing technique for the creation of large flakes and blades and the production of large flake and core tools has been documented, and a dearth of smaller waste flakes suggests that the final stages of tool manufacture were likely conducted elsewhere (Gallegos 1981:4).

   The site is composed of at least 79 discrete loci of lithic tool reduction, many of which also have additional archaeological elements (e.g., rock rings, hearth features). Lithic materials do not lend themselves to absolute dating techniques, and therefore only relative chronology can be developed using lithic artifacts. Such dating techniques focus on the degree of desert varnish, the degree of patination, weathering, and the depth of rock migration into the surface. Other archaeological artifacts and features present include fire-affected rock, charred animal bones, rock rings, cleared circles, a rock shelter, trails, and ceramics. Ceramics are a useful indicator of chronology, and it is known that ceramics were introduced to the area ca. A.D. 1000, and therefore, it can be suggested that the site dates to at least as early as this time period. However, a San Dieguito II tool was located at the site which suggests a date ca. 6000 B.C. Additionally, a high degree of patina and desert varnish has been noted on several artifacts suggesting an early component to this district (Gallegos 1981:6).

   Rock outcroppings, rock features and trails, all of which are present at the North Chuckwalla Petroglyph District, are significant to contemporary Native American groups because they are understood to represent a physical link to the past (Bean et al. 1978:5-54, 6-14, 6-24). The prominent position of the quarry district to the PTNCL has led some to suggest that the quarry likely was used as a landmark and during the ancient Indian period likely would have had a place name for those who travelled along the trail (Gallegos 1981:8).

8. Long Tank

   Long Tank is located in the Alligator Rock ACEC, on northern slope of Chuckwalla Mountains, about 10 miles west of the PSEGS project area. The tanks are in close proximity to the Alligator Rock geologic feature, situated less than 2 miles southeast. This location contains granite tanks which are known to hold water and likely was a spot to stop for water along the PTNCL. Little archival information was available about this location in those sources examined thus far, and no archaeological site record exists. However, the site is known as a location along the trail network as a place where water was accessible.

9. Alligator Rock

   Alligator Rock is a very large rock outcrop immediately north of the Chuckwalla Mountains, about 9.75 miles west of the PSEGS project area. The rock is named for its shape, as its rugged nature resembles the ridges on the back of an alligator. Alligator Rock is within a much larger designated ACEC area, and from the rock itself the PSEGS project would be visible.

   Members of the La Cuna de Atzlan organization suggest that Alligator Rock has spiritual significance (Figueroa 2013b:3). The adjacent Chuckwalla Mountains were likely named for the desert reptile, the large Chuckwalla lizard (Gunther 1984:115), and it is understood by these members that Alligator Rock is a part of these “Lizard Mountains”, and represents the lizard. The understood continuity between these geologic formations is likely why a reptile was used to describe this feature. In discussions with tribal informants it was noted that at least the Quechan language has a word for alligator, ‘cai man,’ that was obtained from Quechan who encountered alligators while travelling further south in the central Mexico area.

   Several archaeological sites are located in the immediate vicinity of Alligator Rock. Two National Register of Historic Places listed districts, the North Chuckwalla Petroglyph District and the North Chuckwalla Prehistoric Quarries District, are located in the Alligator Rock ACEC and are discussed in more detail in respective sections above. However, there are additional sites not located in these districts that are located primarily adjacent and to the west of the Alligator Rock formation. Archaeological artifacts and features at these sites include rock rings, lithic debitage and hammerstones, rock shelters, milling tools and bedrock mortars, petroglyph panels, and trails.

   These archaeological sites likely represent temporary campsites for groups processing plant and lithic materials, or as overnight stops for groups travelling along the PTNCL (Swenson 1984:10). These archaeological resources are important to contemporary Native Americans, primarily because it is evidence of their ancestors. As mentioned, some archaeological artifacts and features, especially petroglyphs and rock rings, often have more ceremonial or religious significance for tribes than sites that are more utilitarian in nature.

10. Dragon Wash (CA-RIV-049)

Dragon Wash is a petroglyph site located in the southeastern Eagle Mountains, about 15 miles west of the PSEGS project and in the direct view-shed of the project. Located partially within the boundaries of Joshua Tree National Park, this petroglyph site has two loci of petroglyphs encompassing about 0.6 acres in total on 6 or 7 boulders. At least 29 distinctive design elements were noted on these panels, with only moderate vandalism noted from surveyors. A trail feature was noted in 1948, but an update to the site in 1975 did not relocate the trail; however, a close look at Google Earth of the desert pavement just east of the wash does appear to show likely ancient Indian trails leading into the wash. Bedrock mortars were identified nearby in 1948, but also were not relocated in the 1975 update to the site. However, while conducting research at the Eastern Information Center at the University of California Riverside, staff noticed that CA-RIV-7317 recorded in 2003 located just south and slightly east of the wash, is a bedrock mortar location and is likely the same identified by earlier surveyors.

It is suggested by members of La Cuna de Atzlan (Figueroa 2013a) that the petroglyphs at Dragon Wash are in line with the Ripley Intaglios, about 60 miles east of the wash. Evidence of this connection is cited by La Cuna de Atzlan, who understand that the “hummingbird” petroglyph at Dragon Wash is also represented by a “hummingbird” earth figure at the Ripley Intaglio site. Another earth figure with a circle and four lines extending out is said to also be in line with Dragon Wash. Some tribal informants do not agree with the interpretation that suggests that one of the Dragon Wash petroglyphs represents a hummingbird.

Without diagnostic artifacts it is difficult to ascribe a time period to the Dragon Wash petroglyphs. A lack of other archaeological evidence does not necessarily suggest that this area was not frequently used by Native American groups, particularly because the alluvial nature of the wash likely has covered or transported any surface artifacts. The site is located in close proximity to the Chuckwalla Valley trail corridor, and likely played a role in the rituals of medicine people. The site is positioned in such a way that if one were to look east they would have a direct line of sight of the Lower Colorado River valley. Tribal informants suggest that line of sight also links Dragon Wash petroglyphs to Palen Pass and through a directionally oriented rock ring at the base of the Coxcomb Mountains.

11. San Pascual Well

The San Pascual Well was located during the Romero-Estudio expedition in 1823-1824 while attempting to establish a route for Euro-Americans to cross the Colorado De sert and more efficiently connect the Los Angeles area to the Tucson region. The well is approximately 5 miles northwest from the PSEGS project area. The expedition named the well San Pascual, and Estudio’s entry in his diary states “we found signs of basket-making by the Indian women on several occasions, bones of horses and pieces of ollas” (Bean and Mason 1962:41). Bean and Mason (1962:41, footnote 22) suggest that this well was in the Desert Center area based on the landmarks provided in the diary, and the fact that the expedition was likely headed for Palen Pass. A General Land Office (GLO) map from 1856 identifies “a well 45 feet deep of fair water in this quarter section” (Brown 1856).

Land Connectivity

Native Americans view their environment in a holistic manner; therefore the places and landforms listed and described earlier in the document are not the only important ones, and should be considered a less-than comprehensive list. In addition, all land, space, air between, above and below these places and landforms are also considered important.

Lorey Cachora, a Yuman traditional practitioner (2000, cited in Bean and Toenjes 2012:19), noted that there is a web of power which connects important landscape features such as mountains and springs. Destruction of this web of power affects the "entire cosmos." Peaks are most important, but valleys between peaks and desert pavements are also important in that they are pathways for "the web that must run through from peak to peak" (Cachora 2000, cited in Bean and Toenjes 2012:19). In discussions with Mr. Cachora, staff has come to understand that the Chuckwalla Valley is part of a multi-layered cultural landscape, and while staff, due to project constraints, must bound the landscape within the view-shed impacted by the proposed solar power towers, the Chuckwalla Valley is nested in concentric rings of larger and larger landscapes. This is not an arbitrary concept. As Mr. Cachora suggests, "after all, we Indians must navigate our lands." Mr. Cachora utilizes the concept of "natural setting" to organize the disparate and seemingly random collection of rock rings, petroglyphs, cleared circles, lithic and ceramic scatters, and mineral, rock and plant and animal source areas into one organized collective. From any one locale of obvious importance to Native Americans, for example a petroglyph site, one will find a sitting place that provides the knowledgeable inhabitant obvious directionality. Attentive to such directionality, one will note distant lines of the land, such as horizons, canyon walls, playas, changes in vegetation biomes, or sweeping alluviums. These lines are the "natural settings." Internalizing these lines, one travels to a destination, and if the travelling inhabitant maintains intent and focus will arrive at a distant destination, marked by a spring, petroglyphs, the nearness of a distinctive landform, etc., where another viewing place will be located and naturally found. In this way landscapes are nested and overlapped one to the next in multiple directions. Staff was standing on the west side of the Chuckwalla Valley with Mr. Cachora when he exclaimed, "I can navigate from here to San Francisco peaks quite easily without ever having made the journey and without a map if I know several natural settings between here and there." These natural settings are what are encoded in the traditional songs and dreams of Chemehuevi, Cahuilla and Yuman people and culture.

Traditional Yuman dreamers make connections between disparate landforms, plants and animals and other cultural, historic, and religious events by dreaming. In the practice of dreaming, the dreamer makes a journey through the land and is presented with signs that provide omens of a person's individual and family capacity for good or ill fortune (Devereux 1956:43). The process of dreaming is understood to often result in the dreamer creating a visual representation of their dream, either by pictographs, or in the case of the Native Americans in the vicinity of the PSEGS project area, as petroglyphs, earth figures, or rock alignments (Whitley 2000:66). This is a form of communication between the dreamer and the supernatural, between the dreamer and the person seeing the rock art, and the supernatural and the person seeing the rock art.

In the Yuman worldview, the current world of the living is sandwiched between an underworld and an above world. The underworld is a place of demons, monsters, snakes, and other forms of malady, poison and disease that medicine people either use or combat for personal or communal gains. The above world is a place where the deceased reside should proper ceremony be conducted by the living to usher their loved ones onto the next life. Johnson (2003:169) explains the Yuman understanding by using an analogy of the Tree-of-Life or World Tree, a symbol common in ancient and historic Mesoamerican cultures;

> …the Tree symbol involves three parts; the roots associated with the underground or underworld; the trunk associated with the present world and as a symbol of the axis mundi, or passageway between the underworld and the upper world; and lastly the branches representing the sky, the upper world or the beyond world, all pertaining to the greater journey of life.

Johnson further explains that the earth figures allow traditional practitioners and those attempting to understand the meaning of life and death, particularly during a time of grieving from the loss of a family member, to come to understand the connectivity of time and space at the place of the earth inscribed figures (Johnson 2003:169).

The Chemehuevi sense of landscape and connectivity between places is revealed in the multiple song cycles they sing. These songs allow people to travel across vast areas and describe numerous locations. The singing of the songs is critical to the understanding of place and spirituality for the Chemehuevi. Each song covered a specific territory, and the person singing the song identified personally with certain landforms in the song, singing “my land” or “my mountain” (Laird 1976:11, 14).

The Cahuilla understanding of the world is partly based around the concept of iva’a, or power. Cahuilla philosophy suggests that all things were and are created by this basic generative power. This power is understood to have been present and available for people throughout history, and it continues to account for present phenomena. Power generally operated for the benefit for humans, but uncharacteristic amounts could be obtained through birth, placation, manipulation, gift or ritual. For example, success in hunting, curing disease, unusual events and differences in cultural attainment are attributed to the presence of this power, as are dramatic variations in topography (Bean 1972:161-163). Thus, the acquisition or loss of this power can have far-ranging implications in terms of the relationships of people to each other, people to their environment, and people to supernatural beings.

Cahuilla people understand that humans are an integral part of the system of nature. That is, “Man was seen as one of a number of cooperative beings, who, together with his fellow Cahuilla, shared in the workings of the universe. Thus, an ecological ethic existed which assumed that any action affected other parts of the system” (Bean 1972:165). In this understanding, humans are obligated to act reciprocally towards the rest of the universe. Bean (1978:165) offers an example of this reciprocal relationship; it was understood that deer allowed themselves to be taken, under the condition that humans would not overkill or waste the deer products, and a plant collector would never take all of the seeds of a plant in order that it should be able to germinate and reproduce. Again, hunting rituals and actions helped to maintain the natural balance between humans and nature.

Built-Environment Field Activities

As a part of the original licensing process windshield surveys were conducted for the built-environment PAA on May 1, 2009 (AECOM- EDAW 2009e) and in May 2010. Five resources were identified. These include: two wooden bridges built in 1931, a transmission line from the late 1950s, a school house dating to around 1935, and a complex of residential buildings and structures built between the 1920s and 1950s. These are referenced, respectively, as the Aztec Ditch Bridge (Caltrans Bridge 56C0102), the Tarantula Ditch Bridge (Caltrans Bridge 56C0103), the Blythe-Eagle Mountain 161-kV transmission line (SMP-H-1024), the Desert Center School House (P-33-6833), and SMP-B-MKM-001. With the exception of the transmission line, none are considered to be in the Area of Direct Disturbance.

On February 13-14, 2013, March 7-8, 2013, and July 18, 2013 subsequent to the amendment being filed, Energy Commission staff visited the project site and the surrounding area. A Built-Environment specialist was in attendance at those site visits and conducted an additional site and project-vicinity field visit on September 18, 2013.

In July 2013 the project owner also conducted additional field survey with regards to built-environment resources.

ANALYSIS OF IMPACTS TO CULTURAL RESOURCES

Determining the Historical Significance of Cultural Resources

Under CEQA, "a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment" (Pub. Resources Code, § 21084.1). Consequently, the Energy Commission, as a lead agency, must evaluate the historical significance of cultural resources by determining whether they meet several sets of specified criteria. Under CEQA, the definition of a historically significant cultural resource is that it is a "resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the CRHR", or "a resource listed in a local register of historical resources or identified as significant in a historical resource survey meeting the requirements of section 5024.1 (g) of the Public Resources Code," or "any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the agency's determination is supported by substantial evidence in light of the whole record" (Cal. Code Regs., tit. 14, § 15064.5(a)).

In general, to be considered historically significant under the CEQA Guidelines, a cultural resource must meet the criteria for listing in the CRHR. These criteria are essentially the same as the eligibility criteria for the NRHP. In addition to being at least 50 years old,[21] a resource must meet at least one of the following four criteria (Pub. Resources Code, § 5024.1):

[21] The Office of Historic Preservation's Instructions for Recording Historical Resources (1995) endorses recording and evaluating resources over 45 years of age to accommodate a potential five-year lag in the planning process.

- Criterion 1, is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- Criterion 2, is associated with the lives of persons important in our past;
- Criterion 3, embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- Criterion 4, has yielded, or may be likely to yield, information important in prehistory or history.

Historical resources must also possess sufficient integrity of location, design, setting, materials, workmanship, feeling, and association to convey their historical significance [Cal. Code Regs., tit. 14, § 4852(c)].

Additionally, cultural resources listed in or formally determined eligible for the National Register of Historic Places (NRHP) and California Registered Historical Landmarks numbered No. 770 and up are automatically listed in the CRHR and are therefore also historical resources (Pub. Resources Code, § 5024.1(d)). However, even if a cultural resource is not listed or determined to be eligible for listing in the CRHR, CEQA allows a lead agency to make a determination as to whether it is a historical resource and, therefore, historically significant (Pub. Resources Code, § 21084.1).

The assessment of potentially significant adverse impacts to historical resources and the mitigation that may be required of a proposed project to reduce any such impacts depend on CRHR-eligibility evaluations.

California Register of Historical Resources Evaluations

Under CEQA, mitigation need only be developed for substantial project-related adverse impacts to historically significant cultural resources (historical resources). Consequently, staff seeks CRHR eligibility recommendations for those cultural resources subject to possible project impacts. The existing documentation for previously known cultural resources may include CRHR eligibility recommendations, and the applicant's or owner's cultural resources specialists often make CRHR eligibility recommendations for newly identified cultural resources they discover and record in their project-related surveys. Staff considers these prior CRHR eligibility evaluations and may accept them or conclude that additional information is needed before making its own recommendations.

When the available information on known or newly identified resources that could be impacted by the proposed project is not sufficient for staff to make a recommendation on CRHR eligibility, staff may ask an applicant or owner to conduct additional research to gather the information needed to make such a recommendation, or staff may gather the additional information. For an archaeological resource, the additional research usually entails some degree of field excavation, called a "Phase II" investigation. For an ethnographic resource, the additional research may be an ethnographic study. For built-environment resources, the additional research would probably be archival. The object of this additional research is to obtain sufficient information to enable staff to validate or

make a recommendation of CRHR eligibility for each cultural resource that the proposed project could impact.

METHODS AND THRESHOLDS FOR DETERMINING SIGNIFICANCE OF IMPACTS TO HISTORICAL RESOURCES

The regulatory threshold for whether a proposed project would have a significant effect with respect to cultural resources is a finding that the project would materially impair the significance of one or more historical resources (Cal. Code Regs., tit. 14 § 15064.5(b)(1)). The CEQA Guidelines define material impairment, in part, as any project action that "demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA" (Cal. Code Regs., tit. 14 § 15064.5(b)(2)(C)). In order to assess whether a proposed project would materially impair the significance of a historical resource, one would therefore need to know and understand why that resource was eligible for inclusion in the CRHR. A resource's CRHR eligibility status has two parts, a value for which the resource is significant and integrity sufficient to convey that significant value (Cal. Code Regs., tit. 14 § 4852(c)). (Note that "significance" as used in relation to the determination of a resource's CRHR eligibility status is a much more narrowly focused technical use of the term than the broader sense of its use at, among other places, section 21084.1 of the Public Resources Code or section 15064.5(a) of the California Code of Regulations.) The significance component of a resource's eligibility status is determined, as noted in the "Determining the Historical Significance of Cultural Resources" subsection above, with reference to its potential associative, design or construction, or information values as set out in the CRHR's four significance criteria (Cal. Code Regs., tit. 14 § 4852(b)(1–4). A resource may be eligible under one or more of these values. The integrity component of a resource's eligibility status is determined with reference to "location, design, setting, materials, workmanship, feeling, and association" (Cal. Code Regs., tit. 14 § 4852(c). Which of these aspects of integrity are relevant in a determination of a resource's CRHR eligibility are dependent on the particular values for which that resource has been determined to be significant. The analysis of whether any of the potential impacts of a proposed project cross the threshold of a significant effect under CEQA, therefore, requires the consideration, primarily, of that project's impacts on each applicable aspect of integrity for each historical resource subject to any such impacts. Dependent upon the particular values for which a resource has been determined to be significant, the aspects of integrity under consideration may be mostly related to the characteristics of the resource itself, or they may also be related to the characteristics of the physical and visual contexts that envelope the resource and whether those contexts would retain the ability to convey the values for which the resource has been found to be significant.

The general procedure of staff's assessment of project impacts to cultural resources, then, is to:

1. Establish the inventory of historical resources, a subset of the Cultural Resources Inventory;

2. Identify and consider the nature of each resource's significance relative to the CRHR's criteria;

3. Consider how subject resources' historical significance are manifested physically and perceptually, and assess the baseline integrity of those characteristics and contexts;

4. Assess, more specifically, those aspects of each resource's integrity that are critical to that resource's ability to convey its historical significance; and

5. Analyze whether potential project impacts would alter any historical resources to the extent that any such resource would no longer be able to convey its historical significance.

Assessment of Impacts and Recommended Mitigation

To identify construction-related impacts to cultural resources that would need to be mitigated, staff first identifies all historical resources and evaluates the potential project impacts to the significant cultural resources to determine if these impacts are substantial and adverse (see above). Staff must then recommend avoidance or other mitigation for substantial and adverse impacts to these historical resources. Staff also must assess whether the proposed project has the potential to impact as-yet-unknown buried archaeological resources and recommend mitigation for impacts to previously unknown but historically significant resources discovered during construction, if impacts to such resources cannot be avoided.

CEQA advises a lead agency to make provisions for archaeological resources unexpectedly encountered during construction, and a project owner may be required to train workers to recognize cultural resources, fund mitigation, and delay construction in the area of the find (Pub. Resources Code, § 21083.2; Cal. Code Regs., tit. 14, §§ 15064.5(f) and 15126.4(b)). Consequently, staff recommends that procedures for identifying, evaluating, and possibly mitigating impacts to archaeological resources discovered during construction be put in place through conditions of certification to reduce those impacts to a less than significant level or to the extent feasible.

Direct and Indirect Impacts

In the abstract, direct impacts to cultural resources are those associated with project development, construction, and operation (co-existence). Construction usually entails surface and subsurface disturbance of the ground, and direct impacts to archaeological resources may result from the immediate disturbance of the deposits, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, excavation, or demolition of overlying structures. Construction can have direct impacts on historic built-environment resources when, for example, those buildings or structures must be removed to make way for the proposed project or when the vibrations of construction impair the stability of historic buildings or structures nearby. New construction can have direct impacts on historic built-environment resources when it is stylistically incompatible with their neighbors and the setting, and when the proposed project produces something harmful to the materials or structural integrity of the historic buildings and structures, such as emissions or vibrations.

Generally speaking, indirect impacts to archaeological resources are those which may result from increased erosion due to site clearance and preparation, or from inadvertent damage or outright vandalism to exposed resource components due to improved accessibility. Similarly, historic buildings and structures can suffer indirect impacts when project construction causes obsolescence and demolition or creates improved accessibility, making vandalism or greater weather exposure possible.

Ground disturbance accompanying construction at a proposed plant site, along proposed linear facilities, and at a proposed construction laydown area has the potential to directly impact unknown archaeological resources. The potential direct, physical impacts of the proposed construction on unknown archaeological resources are commensurate with the extent of ground disturbance entailed in the particular mode of construction. This varies with each component of the proposed project. Placing the proposed project into this particular setting could have a direct impact on the integrity of association, setting, and feeling of nearby standing historic built-environment resources.

ANALYSIS OF IMPACTS TO ARCHAEOLOGICAL RESOURCES

Evaluations of Archaeological Resources

Evaluations of archaeological resources typically require field investigations to gather the information necessary to adequately evidence whether and why particular resources possess historical significance and retain integrity. The most common purpose of evaluative fieldwork is to record observations that establish the association of a resource with significant events, or that establish the resource as a potential source of significant historical information. This type of research focuses on the identification, documentation, and analysis of the information, the data sets that can be extracted from the material remains in archaeological deposits from the physical contexts of and the spatial associations among those remains, and a further research focus, particularly for archaeological resources thought to be potentially significant for their associative values, is the degree to which such resources retain sufficient visual integrity to be able to convey those values.

Field research that supports efforts to evaluate whether archaeological resources may be eligible for listing in the California Register of Historical Resources (CRHR), and therefore qualify as historical resources under CEQA, often includes a combination of surface observation and archaeological excavation. Archaeological deposits usually occur as either relatively thin, broad scatters of artifacts and ecofacts, or as layered, matrix-supported deposits of such materials. The evaluation of broad scatter-type deposits, solely on the basis of surface observation, is appropriate when it can be argued that they are almost entirely exposed at the surface, and that the landforms on the surface of which such deposits are found are older than the commonly accepted date of the initial human occupation of North America, or that the exposed material remains indicate a light and transitory use of the ground surface. For archaeological deposits where such arguments cannot be compellingly made and where the deposits under evaluation are thought to be potentially significant only for their information value, excavation is necessary to identify and assess the spatial integrity of the data sets that any buried components of those deposits may contain.

Staff evaluations, below, of the archaeological resources in the PAA divide the inventory of archaeological and natural resources, found as a result of intensive pedestrian cultural resource surveys (see “Intensive Pedestrian Archaeological Resources Survey” subsection, above) and as a result of additional informal archaeological resource fieldwork which staff has conducted, into three basic groups, those resources on the facility site and subject to physical disturbance for which surface observations provide sufficient information to make recommendations of historical significance, those resources on the facility site and subject to physical disturbance for which phase II archaeological research would be necessary to inform such recommendations, and those archaeological resources beyond the facility site and subject to visual intrusion for which surface observations would provide sufficient information to make recommendations of historical significance, were such data available. On the facility site, for cases where staff thought that surface observations were sufficient to formulate recommendations of CRHR eligibility, such recommendations were made. For archaeological and natural resources on and beyond the facility site where, respectively, staff thought that subsurface data would be needed to develop a recommendation or where no data was available at all, staff made technical regulatory assumptions of CRHR eligibility.

Prehistoric Archaeological Resources

Individual Prehistoric Archaeological Sites in the Project Area

There are three prehistoric archaeological sites from the original siting case (SMP-P-2018, SMP-P-2023, and SMP-P-MT-001) that remain in the revised PAA for the amended project. These three prehistoric sites, along with the six other such sites that are not on the proposed facility site (SMP-P-1015, SMP-P-1016, SMP-P-1017, SMP-P-1018, SMP-P-2014, and SMP-P-2015), were assumed in 2010, for the purposes of CEQA, to be eligible for listing in the CRHR, because there was not enough information at that time to make formal recommendations to the Siting Committee on the historical significance of these resources. That information still does not exist, and staff does not propose to alter the regulatory remedy that was developed for the resources during the original siting case.

The three prehistoric sites that would remain subject to the amended project’s effects and are assumed to be historically significant include one small sparse lithic scatter (SMP-P-MT-001) and two sparse scatters of lithic material and fire-affected rock (FAR) (SMP-P-2018 and SMP-P-2023).

SMP-P-2018 consists of a low density lithic scatter with five clusters of FAR, of granitic, basaltic, and metavolcanic origins (Cluster 1- 9 pieces; Cluster 2- 40; Cluster 3- 10; Cluster 4- 42; Cluster 5- 25). Artifacts lying outside these FAR features included a tested cryptocrystalline battered stone, a gray metavolcanic tested cobble, a cryptocrystalline biface-thinning flake, and a quartz secondary flake. The site, encompassing an area 1,512 m^2, is situated on a stabilized dune on the southwest side of Palen Dry Lake, at an elevation of 484 feet above sea level.

SMP-P-2023 consists of a discrete scatter of FAR (6 pieces), three flakes of quartz and cryptocrystalline toolstone, a battered metavolcanic core, eight granitic metate fragments, and a unifacial granitic mano. The site, encompassing an area 3,768 m^2, is situated on an alluvial fan not far from Palen Dry Lake, at an elevation of 466 feet above sea level.

SMP-P-MT-001 consists of a rhyolite core/chopper, a rhyolite tested cobble, and a rhyolite core. It also has an historic component including a mid-20^{th} century can scatter with one screw-top glass bottle.

These three archaeological deposits may include subsurface components that have the potential to contribute information important to the prehistory of the region, consistent with Criterion 4 of the CRHR. None are likely to be found significant under Criteria 1–3 of the CRHR.

Potential Elements of the Chuckwalla Valley Portion of the Pacific to Rio Grande Trails Landscape, Formerly the Prehistoric Trails Network Cultural Landscape

During the course of the original licensing case for the PSPP, staff designated and evaluated a discontiguous cultural landscape that incorporates prehistoric archaeological resources associated with the Halchidhoma Trail (CA-RIV-0053T). The Energy Commission determined the landscape, so designated, to be eligible for listing in the California Register of Historical Resources. That landscape was referred to in the documents and the conditions of certification that came out of the original licensing case, and in the subsequent research that has been done in partial fulfillment of those conditions, as the Prehistoric Trails Network Cultural Landscape (PTNCL). The landscape, as originally conceived, was limited to an area in the Colorado Desert near Blythe, California, was composed of a network of trails, and included the features and archaeological deposits associated with those trails. The foundation of the PTNCL has been a core group of 224 archaeological sites originally recorded by McCarthy (1993). See **Cultural Resources Figure 3** for a delineation of the PTNCL.

National Park Service (NPS) guidance on the preservation of districts and cultural landscapes, guidance applicable to the consideration of a resource's eligibility for the CRHR, requires the identification of certain resource characteristics. These include resource boundaries, one or more periods of historical significance, explicit thematic associations, and the articulation of the types of discrete resources, of the resource elements that combine to make up the composite district or landscape. The **Analysis of Impacts to Cultural Landscapes** subsection below develops a substantive revision to the original PTNCL concept on the basis of additional research that has been done since, and partly as a result of, the Energy Commission's certification of the Blythe Solar Power Project (09-AFC-6), Genesis Solar Energy Project (09-AFC-8) (GSEP), and Palen Solar Power Project (09-AFC-7) in 2010, staff's subsequent oversight of the construction of GSEP, and staff's ongoing ethnographic and archaeological fieldwork on and around the amended facility site. Staff's primary focus in the present analysis is the Chuckwalla Valley portion of what has been referred to as the PTNCL. Staff now understands the PTNCL to itself represent, simultaneously, small geographic and temporal portions of a much broader, regional Pacific to Rio Grande Trails Landscape (PRGTL), a cultural landscape that encompasses three primary trail corridors from the

southern Pacific coast of California across the deserts and the Colorado Plateau of the Southwest to the northern Rio Grande Valley in what is now New Mexico. Staff believes that the focus here on the Chuckwalla Valley portion of the PRGTL is appropriate to the consideration of the amended project.

In the present subsection, staff begins to develop potential archaeological elements that may become parts of the Chuckwalla Valley portion of the PRGTL. These elements will be identified, described as far as present data will allow, and provisionally interpreted as both stand-alone archaeological resources and as elements that may contribute to the significance of the subject cultural landscape. Due to schedule constraints related to the environmental review of the amended project, staff was unable to more definitively address these elements and, of necessity, has made a series of technical regulatory assumptions about the presence of the elements and the types of constituent archaeological deposits that compose them, and about the CRHR eligibility of those elements and their constituent deposits, constituent deposits which have been assumed, in this manner, to be present. The analysis of the potential effects of PSEGS on these assumed historical resources and staff recommendations on the mitigation that would be required are discussed below in the subsection Assessment of Project Impacts to CRHR-Eligible Archaeological Resources and Recommended Mitigation.

Elements that Bound the Landscape

The exterior boundary of the Chuckwalla Valley portion of the PRGTL is the horizon of the viewshed from the trail routes[22]. This is true of any other portion of the three primary trail corridors that make up the PRGTL. In the case of the subject portion of Chuckwalla Valley, the ridgecrests of the Palen, Coxcomb, Eagle, Chuckwalla, Little Chuckwalla, and McCoy mountains delineate much of the boundary of the PAA for the amended project's visual effects to cultural resources. The portions of those mountains in the viewshed of the Native American trail routes which are part of the PRGTL may contribute to the historical significance of the Chuckwalla Valley portion of the broader PRGTL. These portions, or landscape elements are referred to here as mountain resource areas. From an archaeological perspective (see the *Analysis of Impacts to Ethnographic Resources* subsection below for the ethnographic perspective), these mountain resource areas may harbor places, or the traces or remains of places which represent Native American activity which were directly or indirectly integral to the control and use of this portion of the PRGTL. Potential socioreligious places which may include features such as petroglyph panels, altars, shrines, or rock cairns, places the use of which help to bind a people to the land and legitimate their control and use of it, would contribute to our understanding of the broader themes of overland Native American travel and trade through Chuckwalla Valley. There may also be places in the mountain resource areas which may represent the gathering or extraction of water, plant, animal, or mineral resources for movement along the primary braid of trail routes which runs through Chuckwalla Valley or for the support of the local folk who were engaged in the route's control, maintenance, and use. These places could include springs, seeps, tanks, or plunge pools; stands of plants which were potential food sources or sources of medicinal compounds; habitats of high value animal populations; or mineral resource

[22] The use of routes plural here reflects the fact that most major trails are actually geographic corridors with many intertwined, braided routes rather than one single route.

locales for the extraction of materials such as high quality toolstones, quartz crystals, or turquoise; and any material culture remains associated with the Native American use of any such places. Cultural resources found in these mountain resource areas would, from a regulatory standpoint, need to be evaluated for historical significance as standalone archaeological resources, as potential individual contributors to the historical significance of the broader local trails landscape, and as contributors within a thematic group or area wherein the thematic group may contribute to the broader landscape.

Palen and Coxcomb Mountains Resource Areas

Early in the review process for the present amendment (March 5, 2013), staff identified the portions of the Palen and Coxcomb mountains closest to the proposed facility site (**Cultural Resources Figure 6**) as areas in which to begin the analysis of the amended project's potential to have significant visual effects on cultural resources. The two areas include the most prominent landforms near the facility site and were therefore chosen as reasonable places to start the visual analysis for cultural resources. A litany of impediments interfered with staff's ability to acquire basic information on the presence and the character of any cultural resources in these areas, information that was ultimately requested of the project owner in Data Requests 27 and 28. In an effort to acquire an elementary sense of whether and where significant cultural resources may lie in the Palen and Coxcomb Mountains Resource Areas, staff conducted a limited and informal reconnaissance on July 16 and 17, 2013 of both areas. The reconnaissance was conducted in three, approximately two to five hour meandering pedestrian transects through portions of these remote areas in 110 to 115 °F heat. One of the transects was in the Coxcomb Mountains and the other two were in the Palen Mountains. The results of the reconnaissance were both definitive and imprecise; definitive in that the reconnaissance produced positive and intriguing cultural resources findings, and imprecise in that the reconnaissance was conducted with limited staff resources and was a very limited sampling of the project area of analysis.

The Palen and Coxcomb Mountains Resource Areas clearly harbor prehistoric archaeological deposits that have the potential, on multiple scales, to contribute to the historical significance of the Chuckwalla Valley portion of the PRGTL. What the character, or the profile of the deposit types is that make up the archaeological resource inventory in each area, remains largely unknown. A July 16, 2013 meandering transect through the Coxcomb Mountains in Joshua Tree National Park led to the observation of rock constructions and rock cairns on hilltops and alluvial terraces, and a constructed concentration of flagstone-shaped rock in a structural saddle between interior Coxcomb Mountain ridges. A couple of the rock cairns appeared to have been mining claims. The others did not appear to be so. A July 17, 2013 meandering transect through the Palen Mountains in the Palen McCoy Wilderness revealed a potential prehistoric bedrock cache, a relatively long trail segment, mineral deposits of quartzite, quartz crystals, and either turquoise or chrysocolla, and an apparently relatively ancient packrat midden. While meager at face value, these results objectively demonstrate that prehistoric archaeological deposits are present in both of these mountain resource areas.

Absent a representative sample of the types and numbers of prehistoric archaeological deposits in the Palen and Coxcomb Mountains Resource Areas and given the demonstrable presence of such deposits in both, staff had to make technical regulatory assumptions. Staff assumed the presence, in the subject mountain resource areas, of *at least* the complete range of archaeological deposits that are found in analogous environmental contexts in nearby Colorado and Mojave desert valleys and further assumed the presence of natural resource locales that could contribute to the historical significance of the Chuckwalla Valley portion of the PRGTL. Without substantive resource inventory information for the subject potential resource areas staff was left to assume that these cultural and natural resources are historically significant. For the purposes of the present analysis of the amended project, staff assumed the presence of historically significant archaeological deposits in the Palen and Coxcomb Mountains Resource Areas and assumed that such deposits are 1) individually significant, 2) significant as individual contributors to the Chuckwalla Valley portion of the PRGTL, and 3) significant collectively as the separate Palen and Coxcomb Mountains Resource Areas, areas that also contribute to the historical significance of the Chuckwalla Valley portion of the PRGTL. Any natural resource locales that would have had utility to Native Americans who made use of or exercised control over this portion of the PRGTL are also assumed to be historically significant as contributing elements to the trails landscape, both as individual elements and as elements of their respective mountain resource areas.

The assumptions of historical significance made here mean, from a regulatory perspective, that the archaeological resources which are assumed to be present in the Palen and Coxcomb Mountains Resource Areas are eligible for listing in the CRHR and are therefore historical resources for the purposes of CEQA. To qualify as an historical resource, any cultural resource must be significant under one or more of the CRHR's four evaluation criteria and retain a sufficient complement of the seven formal aspects of integrity to convey the particular values for which a resource is determined to be significant. In the case of the archaeological resources that are assumed to be present in the subject mountain resource areas and that are further assumed to be historically significant, eligible for listing in the CRHR, staff believes that any such resources would most probably be significant under either Criteria 1 or 4 for, respectively, their associative or information values. There may also be cultural resources such as petroglyph panels that may be significant for their design values under Criterion 3. The likely incidence of such resources would appear, however, to be rather slight. The integrity of each assumed archaeological resource, due to the implicit lack of particular data, must also be assumed to be pristine. The regulatory consequences and resolutions of all of these technical assumptions relative to the assessments of the amended project's potential effects on the Chuckwalla Valley portion of the PGRTL and the de facto consequences and resolutions relative to such effects on all historical resources assumed to be significant as standalone resources are set out below in the **Analysis of Impacts to Cultural Landscapes** subsection.

Eagle, Chuckwalla, and McCoy Mountains Resource Areas

As staff steadily labored toward the development of the analysis of the amended project and conducted a number of different field reconnaissances to help refine the information needs for the analysis, staff progressively came to appreciate how the broad, low angle sweep of the subject portion of Chuckwalla Valley tends to mask low profile infrastructure and tends to draw in distant landscape features such as mountain ranges to appear to be closer than they really are. The features of the natural landscape and the different ecological niches spread across it all seem drawn together and bound by the basic topographic structure that underlies this portion of the valley. What followed from staff's more experiential appreciation of the local character of the natural landscape was the belief that, in addition to the Palen and Coxcomb Mountains Resource Areas, analogous mountain resource areas should be taken into account in the present analysis. As a consequence, staff here proposes preliminary delineations for the Eagle, Chuckwalla, and McCoy Mountains Resource Areas (see **Cultural Resources Figure 6)**. Beyond the preparation of images from a handful of key observation points (KOP) around the valley perimeter, the project owner has not evidenced any substantive consideration of the amended project's potential visual effects on these mountain resource areas or on the individual cultural resources that are probably present within them. Staff, for its part, has been unable to acquire the resources to do the work in house, in time to meet the publication schedule for the present document. With the very limited information that staff was able to acquire for the Palen and Coxcomb Mountains Resource Areas, staff assumed the presence of historically significant archaeological deposits in the Eagle, Chuckwalla, and McCoy Mountains Resource Areas and assumed that such deposits are 1) individually significant, 2) significant as individual contributors to the Chuckwalla Valley portion of the PRGTL, and 3) significant collectively as the separate Eagle, Chuckwalla, and McCoy Mountains Resource Areas, areas that also contribute to the Chuckwalla Valley portion of the PRGTL. Any natural resource locales that would have had utility to Native Americans who made use of or exercised control over this portion of the PRGTL are also assumed to be historically significant as contributing elements to the trails landscape, both as individual elements and as elements of their respective mountain resource areas. Here again, as discussed above for archaeological resources in the Palen and Coxcomb Mountains Resource Areas, staff believes that any archaeological resources in the Eagle, Chuckwalla, and McCoy Mountains Resource Areas would most probably be significant under either Criteria 1 or 4 for, respectively, their associative or information values. Based upon a staff generated record search and field investigations related to determining the locations, array and extent of traditional cultural properties staff now knows that there are also known cultural resources such as petroglyph panels in these mountain resource areas that are significant for their design values under Criterion 3 (see **Analysis of Impacts to Ethnographic Resources** subsection, below). The integrity of each assumed archaeological resource in the subject areas, due to the implicit lack of particular data, must similarly be assumed to be pristine. The regulatory consequences and resolutions of all of these assumptions relative to the assessments of the amended project's potential effects on the Chuckwalla Valley portion of the PGRTL and the de facto consequences and resolutions relative to such effects on all historical resources assumed to be significant as standalone resources are set out below in the **Analysis of Impacts to Cultural Landscapes** subsection.

Elements Interior to the Landscape

There appear to be areas within the Chuckwalla Valley portion of the PRGTL that are thematically distinct and may be appropriate to handle as separate elements interior to the broader subject portion of the trails landscape, elements that may contribute to the historical significance of this portion of the landscape. Staff presently sees three such potential interior contributors (**Cultural Resources Figure 6**). These include the BLM's Palen Dry Lake ACEC, and staff's delineated Coxcomb Fringe and Raceway Mesquite Areas. There may also be individual archaeological deposits outside of these interior resource areas that contribute to the significance of the subject portion of the PRGTL.

Palen Dry Lake ACEC

Palen Dry Lake Area of Critical Environmental Concern (ACEC), immediately to the northeast of the facility site, appears to have been proposed in the late 1970s and designated not long thereafter (Ritter 1981). The primary focus of the area appears to be archaeological site (CA-RIV-1515). Relatively sparse assemblages that appear to be characteristic of the ACEC typically include different combinations of basalt, undifferentiated igneous, and quartzite flakes, partial bifaces, quartzite hammerstones, partial groundstone tools, animal bone, fire-affected rock, and heavily oxidized sediment patches. The behavioral implications of these assemblages remain open to interpretation. The assemblages may represent activity related to the sporadic harvesting, processing, and consumption of at least local food resources such as mesquite and palo verde beans, rabbit, desert tortoise, and sheep. The relatively ephemeral character of the activity that these assemblages appear to represent has also been interpreted to be, at least in part, the result of temporary stopovers by travelers along the Coco-Maricopa Trail between the Colorado River and the Coachella Valley (Westec 1980:284). Prehistoric material evidence from within Chuckwalla Valley cited in support of this interpretation includes earthenware ceramics from further east, marine shell beads from the Pacific, and a turquoise pendant.

The formal National Register of Historic Places statuses of either the Palen Dry Lake ACEC or of archaeological site CA-RIV-1515, the apparent primary focus of the ACEC, are presently unknown to staff. If the ACEC or the site has already been determined by the Keeper of the National Register or by consensus between the BLM and the California State Historic Preservation Officer to be eligible for inclusion in the National Register of Historic Places (NRHP), then, by regulatory definition, that area or the site would have already been automatically listed in the CRHR. If neither determination has been made, then staff addresses that scenario here with the statement that staff recommends that both the ACEC and CA-RIV-1515 be assumed eligible for listing in the CRHR under Criteria 1 and 4 for, respectively, their associative and information values.

Coxcomb Fringe and Raceway Mesquite Areas

Staff proposes preliminary delineations for two resource areas internal to the Chuckwalla Valley portion of the PRGTL that have the potential to contribute to the historical significance of the trail landscape. These are the Coxcomb Fringe and Raceway Mesquite Areas as delineated in **Cultural Resources Figure 6**. As the tentative names of these resource areas indicate, the primary focus of the areas are

mesquite stands or patches that most likely tap into subsurface hydrologic regimes that flow down out of the Coxcomb Mountains and Pinto Basin, respectively. These *relatively* dense mesquite patches could potentially represent high value food resource areas for Native Americans on their way across the Chuckwalla Valley portion of the subject overland routes and for those, more locally, who, for example, may have provisioned travelers, engaged directly in trade, or in some manner exerted control over the routes of travel.

Information available to staff at time of FSA publication on the Coxcomb Fringe and Raceway Mesquite Areas is presently limited. Staff has made field observations of archaeological deposits among the mesquites and the dune of the Coxcomb Fringe Mesquite Area and the project owner's apparently incomplete prehistoric archaeological record search data would appear to indicate that at least some archaeological deposits are known to exist in the Raceway Mesquite Area. With limited objective data in hand, staff must assume the presence of historically significant archaeological deposits in the Coxcomb Fringe and Raceway Mesquite Areas and must assume that such deposits are 1) individually significant, 2) significant as individual contributors to the Chuckwalla Valley portion of the PRGTL, and 3) significant collectively as the separate Coxcomb Fringe and Raceway Mesquite Areas, areas that also contribute to the Chuckwalla Valley portion of the PRGTL. Any natural resource locales that would have had utility to Native Americans who made use of or exercised control over this portion of the PRGTL are also assumed to be historically significant as contributing elements to the trails landscape, both as individual elements and as elements of their respective mountain resource areas. Here again, as discussed above for archaeological resources in the Palen and Coxcomb Mountains Resource Areas, staff believes that any archaeological resources in the Coxcomb Fringe and Raceway Mesquite Areas would most probably be significant under either Criteria 1 or 4 for, respectively, their associative or information values. The integrity of each assumed archaeological resource in the subject areas, due to the implicit lack of particular data, must similarly be assumed to be pristine. The regulatory consequences and resolutions of all of these assumptions relative to the assessments of the amended project's potential effects on the Chuckwalla Valley portion of the PGRTL and the de facto consequences and resolutions relative to such effects on all historical resources assumed to be significant as standalone resources are set out below in the **Analysis of Impacts to Cultural Landscapes** subsection.

Inter-resource Area Archaeological Deposits

Although staff is presently unable to identify any individual archaeological deposits that lie outside of the tentatively defined interior resource areas in the Chuckwalla Valley portion of the PRGTL, individual deposits which would contribute to the significance of that portion of the overarching landscape may exist and need to be taken into account. Such deposits could be thematic outliers of any of the defined resource areas, or thematically independent of those defined areas, and, yet, represent integral elements of the thematic fabric of the Chuckwalla Valley portion of the subject landscape, elements, the inadvertent exclusion of which could degrade, perhaps significantly, the ability of this portion of the landscape to convey its historical significance.

Historical Archaeological Resources

There are 51 historical archaeological sites from the original siting case that remain in the draft revised PAA for the amended project. Thirty-seven of these 51 archaeological deposits, along with two other such deposits that are not on the newly proposed facility site (SMP-JR-101 and SMP-JR-102), were assumed in 2010, for the purposes of CEQA, to be eligible for listing in the CRHR, because there was not enough information at that time to make formal recommendations to the Siting Committee on the historical significance of these resources. That information still does not exist, and staff does not propose to alter the regulatory remedy that was developed for the resources during the original siting case. The balance of 14 historical archaeological sites from the original siting case were recommended as ineligible for listing in the CRHR. Staff does not propose to alter those recommendations either.

The original thirty-seven historical archaeological sites that would remain subject to the amended project's effects and are assumed to be historically significant primarily appear to relate to the historical themes of refuse disposal and mining. Subsequent to the publication of the PSA for the amended project, staff identified a portion of the historic Ironwood Mining District in the revised PAA. A description and a discussion of that resource follow as well.

Refuse Disposal

Uncertainties in the reliability of field identifications of dateable tin can traits make it impossible to confidently attribute specific resources to periods of significance. As such, the Commission assumed eligibility for all of the refuse deposit sites having artifacts predating 1950 and that most are associated with WWII military training activities.

Thirty-nine historical refuse scatters, predominantly of tin cans, are present within the original PAA, found within three distinct contexts[23]: alluvial washes, roadsides, and off-road between alluvial washes. It is likely that some of the discards in washes are re-deposited. It is also likely that visitation to these out-of-the-way places (off-road) suggest these locations were destinations rather than way-points, used for specific activities, such as placer mining. If true, the implication would be that the discarded materials are more likely to be associated with a single individual or group over a limited duration of time. In contrast, roadsides are assumed to be subject to greater quantities of traffic, and therefore, subject to more frequent discard events over a longer time frame, associated with a wide range of unrelated individuals. Lastly, dune refuse is more likely to reflect single discard episodes as the dunes are difficult to get to and unlikely to have been habitually visited.

Seven alluvial wash scatters (SMP-H-1006, SMP-H-1010, SMP-H-1011, SMP-H-2006, SMP-H-2021, SMP-H-DS-467, and SMP-H-TC-032), 19 roadside scatters (SMP-H-1003, SMP-H-1008, SMP-H-1013, SMP-H-1020, SMP-H-2003, SMP-H-2007, SMP-H-2010, SMP-H-2011/12, SMP-H-2017, SMP-H-2019, SMP-H-DS-465, SMP-H-DS-466,

[23] Only 25 of the 41 refuse scatters have been classified or described. The remaining 17 were only recently found during the May 2010 survey along the new transmission line. These include: SMP-H-JR-101, SMP-H102, SMP-H103, SMP-H-104, SMP-H-105, SMP-H-106, SMP-H-107, SMP-H-109, SMP-H-110; and SMP-H-TC-001, SMP-H-006, SMP-H-007, SMP-H-008, SMP-H-009, SMP-H-020, SMP-H-022, and SMP-H-032.

SMP-H-JR-109, SMP-H-JR-110, SMP-H-TC-008, SMP-H-TC-009, SMP-H-TC-020), and 9 off-road scatters between alluvial washes (SMP-H-1004, SMP-H-1009, SMP-H-1021, SMP-H-1022, SMP-H-1023, SMP-H-2002, SMP-H-2004, SMP-H-2008, and SMP-H-DS-712) are discussed below. Can types, contents, labels, and mode of opening are used to determine the date range[24] of discard events and consumption patterns that might inform on possible associated localized activities. At the end of each subsection, these sites are evaluated as resource classes to avoid report redundancy.

Alluvial Wash Refuse Scatters

SMP-H-1006 is another very sparse, elongate scattering of nine tin cans and a single glass medicine bottle spread along an ephemeral wash, over an area of 11,869 m^2. It is situated on the upper alluvial fan, at an elevation of 605–610 feet. Discarded items date to the 1920s and later. Artifacts include beverages and evaporated milk, with three church key-opened cans, one knife-punched sanitary can, and a key-strip-opened can with no lid. Also included is one sanitary can and a medicine bottle (2.5-inches tall, 2-inch base with markings “CHESEBROUGH/MFG/CO CD/ NEW YORK”).

SMP-H-1010 is an elongate scattering of 33 tin cans and a medicine bottle widely dispersed over 37,680 m^2. It is located on the mid-portion of the alluvial fan, at an elevation of 570 feet, spanning several closely spaced northeast-trending washes. Discarded items likely date to the 1930s and later. Cans, including beverages and fish, were opened using punched-hole and church key methods. On the east side of the washes, a segment of tank tracks (nine feet wide, with 18-20 inch treads) trail off in an east-southeasterly direction for a distance of 140 feet across desert pavement. It is not clear whether these tracks are associated with the refuse debris or not.

SMP-H-1011 is a very sparse scattering of 13 tin cans, a pail, and a glass bottle, widely dispersed over 11,304 m^2. It is located on the upper alluvial fan at an elevation of 580 feet, straddling several small washes. Discarded items range in date from as early as 1908 to the 1940s. Probable can contents include kerosene, fish (one-pound tin embossed with “Vacuum Packed, California U.S.A.”), and tobacco, with P-38 and knife-punched openings noted. The bottle, of amber glass, measures 6¾ inches tall with a 2½-inch base, exhibiting an Owens-Illinois maker’s mark and label “Duraglas” on the base, dating to at least the 1940s.

SMP-H-2006 is a large (18,133 m^2) but sparse scattering of 14 tin cans, situated in the northwest quadrant of the APE, on an active alluvial fan cut by a braiding northeast-trending ephemeral wash. Can types include three-piece, cylindrical sanitary cans containing food, as well as motor oilcans, beverage cans, and an oblong F-style can. Most have crimped ends with lip-side seams. Two cans are hand-soldered, hole-in-cap. Opening methods include church key, knife-cut, P-38, punched-hole, tear-top, and key-

[24] Field observations by the consultant regarding can sizes and fabrication methods are extremely limited, constraining ability to attribute date ranges. The best indication of discard date rests on observations of can opening methods. Staff offer very rough estimates based on the following guidelines regarding can openings: church key openings post-date 1935; P-38 openings post-date 1942; pull-tab openings date to the late 1960s; center-hole and circle-slice-openings date from the late 1920s to early 1930s. Additional guidelines include can types: sanitary cans in general use by 1920s.

strip. The site appears to be in good overall condition with evidence of minor erosion. There does not appear to be a subsurface component.

SMP-H-2021 is a sparse scattering of about forty tin cans in a stable alluvial fan cut by an ephemeral wash. The site, 19,860 m^2 in size, situated in the northwest quadrant of the APE, encompasses two concentrations with a few outliers between them. The southwestern concentration consists of four three-piece, cylindrical cans and a church key-opened beverage can, all machine-soldered, as well as one matchstick-filled can. The eastern concentration consists of eight three-piece, cylindrical containers, six key-strip-opened, non-reclosable containers, all machine soldered. Can-opening methods include punched-hole, X- or T-cut, and key-strip. Five of the cans are matchstick-filled and six are hole-in-cap. Three of the hole-in-cap cans are key-strip-opened and have "Brazil Inspeccionado" written on top of the can. A gray enameled metal bowl measures 5 3/16 inches across the top, 3⅝ inches across the base, and 2 inches high. A U-shaped handle has broken off the side of the bowl. Artifacts outside of the concentration include 12 cans. These include three-piece, cylindrical sanitary food cans and beverage cans with crimped and flush ends and lip- side seams, all machine-soldered. Opening methods include jab-lift, church key, and punched-hole. Five of the cans are matchstick-filled.

SMP-H-DS-467 is a sparse scattering of about 20 cans spread over 1,860 m^2, crosscut by a series of small north/south trending ephemeral washes. The cans include: four vent-hole filler condensed milk cans, one soldered hole-in-cap condensed milk can, five church key opened beverage cans, one con-top beverage can, five double seam sanitary-type food cans, and one external-friction lid can, all of which date from between the 1930s to 1950s. Two aluminum soft-top tear tab beverage cans were also found in the area post-dating the 1960s.

SMP-H-TC-32, 3,000 m^2 in size, is a sparse scattering of cans of mixed age, including: 19 bimetal pull ring aluminum cans, 6 12 oz. church key-opened beverage cans, 2 oil cans, 8 food cans (opened via jab-lift or rotary methods), an oval herring tin, and a rectangular sardine can. Several ephemeral drainages cross the site.

Alluvial wash refuse scatters, as a resource class, *may* be attributable to specific activities such as placer mining or military training exercises that contribute to the broader history of the region, and so could be eligible for both the CRHR under Criterion 1.

Roadside Refuse Scatters

SMP-H-1003 is a very sparse, elongate scattering of eleven tin cans and one clear glass fragment spread along an active ephemeral wash over an area of 12,560 m^2. It is located in the southwest corner of the APE, just northeast of the Corn Springs Road exit from I-10, on the upper alluvial fan, at an elevation of 672 feet. An east-west trending unimproved road crosses the site. Discarded items date to the 1930s and 1940s. Probable can contents include motor oil (4), beverages (3), and water-soluble coffee (1), with key-strip and church key openings. Labeling on the motor oil cans include: "SAE 30" and "RICHFIELD OIL/ 20SAE/20 W/ CORPORATION". All artifacts appear to be surficial and some may be redeposited debris from the wash.

SMP-H-1008 is a historic-period debris scatter consisting primarily of tin cans (unspecified number), widely spread over an area of 52,752 m^2. It is located in the center of the proposed PSGES plant site, mid-way along the alluvial fan, at an elevation of 548 feet, straddling an historic road (SMP-H-1032) as well as two northeast-trending ephemeral washes. Discarded items likely date to the 1930s or later. A military-issue metal spoon, with "U.S." stamped on the handle, suggested the site is related to DTC/C-AMA activities between 1942 and 1944. Probable can contents include beverage and meat, with key-strip openings. Can types include cylindrical sanitary cans, flat round cans, oblong F-style cans, square tins, and hinged-lid cans. Other items present include a glass jar fragment and several pieces of milled lumber.

SMP-H-1013 is a sparse scattering of 29 tin cans, a fragment of iron, and a glass bottle, dispersed over 11,304 m^2. It appears to represent historic-period roadside refuse, situated on both sides of an historic road (SMP-H-1032), at an elevation of 532 feet. Several ephemeral washes, however, also cut through the site, trending northeasterly toward Palen Dry Lake. Discarded items range in date from the 1930s to the 1940s. Probable can contents include tobacco and sardines, with key-wind and P-38 openings. Various sizes and types of cans are noted, including three-piece cylindrical, sanitary cans, hinged-lid pocket tobacco tins, and rectangular sardine cans with crimped ends and lip-side seams. The clear glass condiment bottle (5 inches high

SMP-H-1020 is a large, elongate scattering of about 170 tin cans, widely dispersed along a braided wash, encompassing an area of 134,706 m^2. It is situated in the southeastern quadrant of the APE, on the upper alluvial fan, at an elevation of 574–590 feet, about 280 feet northeast of the I-10 corridor fence. A graded dirt road, trending west-northwest, bisects the northern end of the site. Its overall orientation along the wash axis, as opposed to the road axis, justified classification in this subsection.

Discarded items appear to date from the 1930s and 1940s. Known can contents include motor oil, fuel, beverages, and food. Openings include church key, P-38, key-strip, tear-tabs, punched-hole, jab-lift, and rotary types. Can types noted include three-piece, cylindrical sanitary, crown cap/cone top, non-reclosable and reclosable, and flat round, crimped ends and crimped and lip-side seams. A rectangular fuel can (14 inches high with a 2-inch base and 2-inch thread-cap opening) has a faded maker's mark (an oval with a horizontal diamond flanked by "20" and "2" and is embossed on the base with "DES PAT 103023," above the maker's mark and "3512 C2" below.

SMP-H-2003 is a sparse scattering of 19 tin cans, a clear glass, screw-cap condiment jar, an amber beverage bottle, and bailing wire, bisected by the an historic road (SMP-H-1032). These items, spread over 30,772 m^2, are situated on the alluvial fan cut by a shallow northeast-trending, ephemeral wash, at an elevation of 559 feet. Can types include three-piece, cylindrical sanitary food, motor oil, and beverage cans with flush or crimped ends and lip-side seams. Filling methods consist of hole-in-cap, matchstick-filled, and entire-end filled. Opening methods include punched-hole and church key. The oval condiment jar (3½ inches high with a 2⅜-inch opening), is embossed on the sides with a Hazel-Atlas Glass Company maker's mark, and the numbers "5899 and 7" on the base. The beverage bottle (6⅞ inches high by 2¾ inches in diameter and a one-inch opening) exhibits a side seam/case mold, and an Owens-Illinois Glass Company maker's mark, with the word "DURAGLAS" written in cursive script. The numbers "6, 3"

followed by a period, and “32” are embossed on the base. The words “NO DEPOSIT NO RETURN NOT TO BE REFILLED” are also embossed on the shoulder of the bottle. The age of this bottle post-dates 1940 (Toulouse 1971, p. 403).

SMP-H-2007 is a small (5,275 m^2), early twentieth-century scattering of eleven tin cans and other associated artifacts, situated on an historic road (SMP-H-1032). Can types include three-piece, cylindrical sanitary food cans, one beverage, a bimetal three-piece cylindrical can, key-opening, non-reclosable can, and a square can with an oval-end internal friction lid (Hershey’s Cocoa). Cans have crimped and flush ends and crimped and lip-side seams. Opening methods include tear-top, key-strip, punched-hole, and church key. Additional artifacts include a crushed metal pail, 10 fragments of aqua glass, a shard of amethyst glass, a Colt-45 shell casing, and tar slag. The shell casing measures 15/16 inches by ½ inch in diameter. The center-fire casing has “WRA CO 45 COLT” (Winchester Repeating Arms) stamped on the end.

SMP-H-2010 and SMP-H-2011/2012 appear to be extensions of one large, discontiguous, elongate refuse scatter, associated features, and tank tracks, situated on the an historic road (SMP-H-1032) and continuing from the intersection of an unnamed southwest-trending, graded dirt road westward for a distance of 2,000 feet. Additionally, discontinuous segments of tank tracks roughly parallel SMP-H-1032, at the southern margin of the site(s). Track segments from the westernmost site (SMP-H-2010) are 466 feet long, with 18–24-inch treads spaced 6 feet apart. Two track segments from the easternmost site (SMP-H-2011/2012) measure 430 feet and 140 feet in length, respectively. Both exhibit 24-inch treads spaced 8 feet apart.[25] Discarded items have a wide range of dates spanning the first half of the twentieth century.

Artifacts with SMP-H-2010 (westernmost portion) include 111 tin cans/lids; a glass jar; aqua, green, and amethyst glass fragments; and ceramic fragments. Tin can types include three-piece, cylindrical sanitary food, key-opening, non-reclosable, oblong F-style, easy-open oblong, and flat round. Most have crimped ends with lip-side seams. A few of the cans are hand-soldered, hole-in-cap with a couple of matchstick-filled. Opening methods include key-strip, X-cut, jab-lift, hinged-lid, twist-open, church key, knife-cut, and punched-hole. One small tin can (2 inches in diameter and ¾ inch high) is embossed with “BARRINGTON + HALL Soluble Coffee.” A glass screw-top jar (5½ inches high by 4 inches in diameter), is embossed with “P-1048,” a “Knox Glass Company” maker’s mark, and a “12” on the base. Additional items include 20 fragments of whiteware, found in a 3-foot-diameter area; pieces of a crock-pot (base and lip fragments); a discrete deposit of fragments from an amethyst glass bottle (19 pieces); another cluster of amethyst glass (25 pieces) containing rim fragments and a base fragment; fragments (20 pieces) of two green glass bottles; and fragments of two amber glass bottles.

[25] The tank track treads match the width of M2 and M3 halftrack transports from DTC activities (Meller 1946).

Artifacts from SMP-H-2011/2012 include 60 cans/lids and other historic-period debris. Tin can types include two- and three-piece, cylindrical sanitary food and beverage cans, key-opening non-reclosable cans, and hinged-lid pocket (tobacco tins). The cans have crimped and flush ends with lip-side seams and are machine-soldered. A few of the cans are hand-soldered, hole-in-cap. Opening methods include key-strip, punched-hole, and circle slice. Among the assorted other items are a 6-ounce Coca Cola bottle with "Los Angeles" written on the base, fragments of an amber glass jug (Purex), a rusted pocketknife with a 3¾-inch blade, a ceramic sparkplug (3 inches long "Champion/Ford"), and miscellaneous modern debris.

Further, five historic/modern campfire rock rings are situated within the western site (SMP-H-2010), with three clustered south of the road and two north of the road at the eastern end. In addition, three upright survey posts of milled lumber align due north along the north-south half-section line, north of the road. It is also likely, given the roadside context and age of this road, and the wide apparent date range of associated artifacts, that multiple camping and discard events during the entire twentieth century are represented.

SMP-H-2017, a small (1,570 m^2) very sparse scattering of tin cans, is situated on the lower alluvial fan in the northwest quadrant of the APE, at an elevation of 563 feet, adjacent an old northwest-trending unimproved dirt road. Can types include a three-piece, cylindrical, internal friction lid, sanitary food and an oblong, key-opened, hole-in-cap meat tin. Can types present appear to date to the early twentieth century. Based on the age of artifacts, SMP-H-2017 is a single event deposit.

SMP-H-2019 is a refuse scatter, 6,400 m^2, on the edge of an unimproved road heading to Sidewinder Well (~0.5 miles to the north), between two ephemeral washes. It consists of 21 tin cans, a small medicine bottle, and a screw-top whiskey bottle. The cans include: 3-piece cylindrical sanitary food and motor oil, beverage, and a pear-shaped meat (ham) tin. Canisters have crimped and flush ends and lip-side seams. Opening methods include church key, P38, knife cut, bayonet, and punched hole. Three of the cans are match-stick filled.

SMP-H-DS-465 is refuse scatter of glass fragments, bottles, and cans, situated on the west edge of Corn Springs Road near the intersection with a gas pipeline road, on the south side of a flood diversion dike that probably served as a wind break. It consists of three concentrations, spread over 3,073 m^2. Concentration 1 includes: a single Clorox bottle base, a metal bolt, 40 fragments of green and brown glass fragments, including a bottle base embossed with an Owen's Illinois maker's mark dated "53" (Toulouse 1971), 20 sanitary cans with rotary and church key openings, and a single external friction lid embossed with "For Coffee Pot or Percolator Regular Grind". Concentration 2 contains 20 sanitary cans, a single cone top beverage can, a large juice can, and a fragmented aqua glass preserve jar. Concentration 3 includes 10 church key opened beverage cans, a coffee can, a vent hole condensed milk can, and a small meat tin. Outside these concentrations is a scattering of additional refuse, including glass fragments (10 green, 50 brown glass), a clear glass soda bottle appliquéd with "Suncrest", a clear glass bottle appliquéd with "Nehi Beverage", and 25 sanitary cans (3 church key opened, three vent-hole condensed milk cans, one meat tin, and one rectangular can with a screw top that is possibly a lighter fluid tin).

SMP-H-DS-466 is a very small refuse deposit, about 6 m^2, of approximately 10 metal fuel cans, an oil filter, and an air or exhaust filter, situated adjacent the gas line road south of I-10, probably representing a single event of vehicle maintenance. These items post-date 1945.

SMP-H-JR-101 is a small refuse deposit, 100 m^2, situated at the west-bound on-ramp of I-10 at the intersection with Chuckwalla Road. It consists of 4 cans (one sanitary food, two beverage, and one sardine), as well as three pieces of wood lath. These items post-date 1945.

SMP-H-JR-102 is a broad refuse scatter, 7,134 m^2, at the east-bound off-ramp of I-10 at the intersection with Chuckwalla Road. It consists of 26 metal cans and about 75 glass fragments. The cans include: bi-metal beverage cans, hole-in-cap milk cans, sanitary food cans, cone-top beer cans, oil cans, aerosol cans, and a paint bucket. Opening methods include P38, rotary, pull-tab, key-strip, and knife-punched. The glass is primarily from beverage bottles and two clear glass jars.

SMP-H-JR-109 is a small refuse scatter, 225 m^2, not far from the Blythe-Eagle Mountain 161-kV transmission line service road. It consists of four metal sanitary cans with stamped external ends and lipped seams, opened by P38 and church key methods.

SMP-H-JR-110 is a refuse scatter, 1,505 m^2, situated at the intersection of an east/west trending road and a north/south trending dirt road, approximately 5 miles southwest of the Desert Center Airport and Gruendike's well. In consists of five cans, a shotgun shell cap, and a set of tank tracks. The cans include one meat tin top, two beverage cans, one baking powder can, and one sanitary food can. The beverage cans exhibited crimped ends, lapped seams, and were unopened. The baking powder can also exhibited crimped ends and lapped seams, with a twist-open end. The sanitary food can exhibited stamped external ends and crimped seas, and was opened by a P38.

SMP-H-TC-008 is a refuse scatter, 1,911 m^2, situated along a portion of historic road (SMP-H-1032) leading straight to the Desert Center Airport. It contains 15 cans including 13 metal sanitary cans opened by knife tip, key strip and jab lift, as well as one sardine tin with external stamped ends and crimped seams (marked "SARDINE NORWAY", and one tobacco tin with a match striker on the bottom.

SMP-H-TC-009 is a refuse scatter, 3,605 m^2, situated along an east-west dirt road, in the alluvial plain between Palen Dry Lake and Desert Center, approximately 3 miles north of I-10. It contains the following: 3 beer and beverage cans, a pocket tobacco tin, 3 food cans, 3 juice cans (one marked "S+W APPLE JUICE"), a 3-gallon bucket, and an amber glass whiskey bottle. Cans were opened using methods including a knife tip, key strip, church key, and a bayonet.

SMP-H-TC-020 is a small refuse scatter, 1,224 m^2, along an east-west dirt road, just over a mile north of I-10. It contains two beverage cans and 6 sanitary cans opened using knife tip, jab lift, rotary, church key and P-38 methods. Two milled wood fragments with embedded nails were also found.

Off-Road Refuse Scatters between Alluvial Washes

SMP-H-1004 is another sparse, elongate scattering of historic-period debris consisting of an unspecified quantity of tin cans, porcelain ceramic fragments, a jadeite (opaque green glass) fragment, and six pieces of modern wood lath. It is situated on the upper alluvial fan, at an elevation of 573 feet, spread over an area of 27,632 m^2. An unnamed, unimproved two-track road runs alongside the eastern edge of the site with ephemeral washes on both sides. Discarded items post-date 1935 and may be associated with activities related to the DTC/C-AMA Cultural Landscape/Historic District. Probable can contents include motor oil, tuna, and beverages, with both church key and P-38 openings. Labeling on motor oil cans include: Esso, SAE 40, and Shell Oil.

SMP-H-1009 is another widely dispersed elongate scattering of modern and historic-period debris, straddling a braiding northeast-trending wash, encompassing an area of 44,038 m^2. It is located on the upper alluvial fan at an elevation of 615 feet. An unspecified number of discarded items range in date from the 1930s to the late 1960s. Probable can contents include meat, fish, milk, and beverages, with pull-ring, church key, key-strip, and punched-hole openings. A single olive-green glass bottle has an Obear-Nestor Glass Company maker's mark dating to between 1915 and at least 1971 (Toulouse 1971).

SMP-H-1021 is a small (20 m^2 area) scattering of eight tin cans and 21 can lids (most stacked within the cans) situated on an ephemeral dune transitioning from the lower alluvial fan, at an elevation of 490 feet. All are three-piece, cylindrical sanitary food containers with center-hole and circle-slice opening methods dating from the late 1920s to early 1930s. This site appears to represent a single episode of refuse discard, retaining integrity because the cans appear to have remained in place for some time. It is possible that more tin cans are buried in the sand near the surface deposit.

SMP-H-1022 is a widely dispersed scattering of 24 tin cans and a few other miscellaneous artifacts on an alluvial fan within an active northeast-trending ephemeral wash, encompassing 63,271 m^2. It is situated in a transitional area between an alluvial fan and an ephemeral dune area, at an elevation of 550 feet. Can types include three-piece, cylindrical sanitary food and beverage, and oblong, key-opened, two-piece cylindrical, and key-opening, non-reclosable containers. Machine-soldered cans have flush and crimped ends and lip-side seams. Opening methods include P-38, key-strip, church key, punched-hole, and X-cut. A screw-top jar (5 1/16 inches high, base diameter of 3⅞ inches, and 2⅞-inch opening) is embossed with an Anchor Hocking maker's mark and the numbers "3", "5", and "3900." A screw-top bottle (6 ⅞ inches high by 2¾ inches in diameter with a 1 ⅛-inch opening) is embossed with an Owens-Illinois maker's mark and the numbers "6", "3", and "32." The words "NOT TO BE REFILLED NO DEPOSIT NO RETURN" are embossed on the shoulder of this bottle. This bottle dates between 1929 and 1954 (Toulouse 1971, p. 403). A small piece of lumber (13 inches long by 2½ inches wide by 1½ inches thick) is also present.

SMP-H-1023 is a small site (408 m^2) containing seven 6-ounce Coca-Cola bottles. It is situated within a transitional area between an alluvial fan and an ephemeral dune area at an elevation of 551 feet. A discrete deposit of four bottles is in the northwest portion of the site with two bottles south and one east of the cluster. One bottle is not embossed. The remaining bottles are embossed with the following: four bottles with "El

Centro Calif.," one with "Bakersfield Calif.," and one with "Los Angeles Calif." Five bottles at the site have manufacture dates of 1942, indicated by a mark of "42" on the heel and one bottle has a manufacturing date of 1941 (Lockhart 2007). This site appears to represent a single refuse discard event dating to the DTC/C-AMA years. The site is located near a set of tank tracks (SMP-H-1026). No apparent subsurface component was observed during recordation.

SMP-H-2002 is a widely dispersed scatter of 26 tin cans, a glass screw-top medicine bottle, clear glass fragments, and milled lumber. It is situated on a northeast-trending ephemeral wash, in the northwest quadrant of the APE, encompassing 387,005 m^2, transitioning between stable alluvium and sedimentary sand deposits, at an elevation of 567 feet. Can types include three-piece, cylindrical sanitary food and beverage, oblong F-style, key-opened coffee tin, and non-reclosable cans. All have crimped ends with lip-side seams. Can filling methods include one hole-in-cap, three matchstick-filled (evaporated milk cans), and the rest are entire-end filled. Opening methods include church key, key-strip, P-38, punched-hole, knife-cut, and X-cut. The medicine bottle (5½ inches high by 2¼ inches by 1½ inch wide) exhibits a molded side seam. The intact metal cap (1¼ inches outside diameter) and sits on a glass lip. A maker's mark (the letter "I" inside an oval) and the letters/numbers "23, 7, 7 C, 51 S B 6856 – A" are embossed on the textured surface of the base. Two pieces of lumber are present, measuring 15½ inches long by 5¼ inches wide by 1½ inches thick, and 68 inches long by 5 inches wide by 1½ inches thick.

SMP-H-2004 is a small very sparse scattering of four tins cans, two bottles, and a brass belt buckle. These items were found situated within a small locus (2,826 m^2) on the alluvial fan at the western edge of the APE, alongside a shallow northeast-trending ephemeral wash. Four hole-in-cap, hand-soldered, three-piece, cylindrical sanitary cans with crimped ends and side seams are present, with P-38 and punched-hole openings. The two broken beverage bottles (3 7/16 inch diameter), of amber glass, had no visible maker's marks. The site appears to be in good overall condition with no indication of a subsurface component.

SMP-H-2008 is a refuse scatter with a concentration of 24 tin cans and fragments of a clear glass bottle, along with a more widely distributed 30 additional cans/lids and the base of a clear glass jar. These items were found situated within a small locus (2,750 m^2) on the alluvial fan at the western edge of the APE, between two shallow northeast-trending ephemeral washes. The site appears to be in good overall condition with no indication of a subsurface component.

DS-712 is a very small concentration of six rusted metal vehicle parts, possibly from a tractor or similar heavy equipment, found within a one-meter diameter area, about 275 meters south I-10 on a sandy terrace with young desert pavement. These parts include: a pedal embossed with a "C", 2 leaf springs, 1 strap, and 2 pieces of unidentified metal (one marked with serial number "T-O-11527". The site appears to be in good overall condition with no indication of a subsurface component.

Off-road refuse scatters, as a resource class, in this case, are likely associated with military training maneuvers during World War, thus, possibly eligible for the CRHR for an important event in our nation's history, under Criterion 1. They are not typically reflective of a distinct construction style, type, or design under Criterion 3 of the CRHR. These resources may yield additional information regarding the past history of the area under Criterion 4. Therefore, staff assumed, and the Commission agreed, that these resources are eligible for the CRHR. PSEGS impacts to these resources, if unavoidable, must be mitigated.

Mining Resources

Three possible placer mining claims, SMP-H-1005, SMP-H-1007, and DS-327, dating to the first half of the twentieth century, are discussed below.

SMP-H-1005 is located in a shallow, active wash, on the alluvial fan in the southwestern quadrant of the PAA, situated at an elevation of 600–629 feet. It consists of one standing wooden post with a large, widely dispersed scattering of associated historic-period and modern debris bordering the wash, encompassing an area 121,712 m^2. The post, measuring about 3½ inches in diameter and 55 inches tall, has a wire nail in it. Associated historic-period debris includes three bottles and 125 cans. The bottles include two half-pint, amber glass bottles (one with an Anchor Hocking maker's mark dating from 1938 onward, and another with a maker's mark "F" in a hexagon manufactured by Fairmount Glass works between 1945 and 1960). The third, a clear glass bottle with an Owens-Illinois maker's mark, dates between 1929 and 1954. Scripts on all three bottles read "Federal law forbids sale or re-use of this bottle," which post-dates 1935. The cans are primarily church key-opened beverage cans, key-strip-opened cans, three water soluble coffee cans, one Hines apple juice can, a Coors beer can, several motor oil cans (SAE 50, SAE 30, Texaco and Pennzoil), and a lard pail.

SMP-H-1007 is located in another shallow active wash (about 2,000 feet east of SMP-P-1005), on the alluvial fan in the southwestern quadrant of the PAA, situated at an elevation of 605–625 feet. It consists of two standing wooden posts with a large, widely dispersed scattering of associated historic-period and modern debris, encompassing an area 252,770 m^2. One post has a cairn of rocks stacked at its base with a piece of bailing wire on top (3½ inches in diameter and 38 inches tall). The second post, eight feet away (same diameter and 78 inches tall), is lashed to a metal fence post with bailing wire. A clear glass jar (dating between 1900 and at least 1971) is attached to the post with bailing wire (maker's mark believed to be Thatcher Manufacturing Company).

Portions of a wooden staircase are situated nearby, along with other construction debris, intermixed with galvanized rubber and a six-inch metal pipe, a shovel, a hand saw, automobile parts (a Ford vehicle grill, two air filters), and over 200 cans. The vast majority of the cans, of various sizes, are church key-opened beverage cans and ring-pull cans. Other cans at the site include key-strip-opened cans, sanitary cans, motor oil cans, rotary-opened cans, P-38-opened cans, meat tins, and a pocket tobacco tin.

DS-327 is, likely, a historic period placer mining claim marker, located south of I-20, in desert pavement. It consists of a four-by-four inch wood post, standing five feet tall, supported at the base by large cobbles. A tin beverage can is attached to the side of the post with two nails. No associated artifacts were evident at the time of recordation.

It is possible that these mining claims relate to the Chuckwalla Placer boom that occurred during the 1910s and 1920s. A review of the BLM's National Integrated Land System (NILS) GeoCommunicator website,[26] does show a cluster of closed placer mining claims within the PSEGS. Further research of records at the BLM could resolve this question. It is also possible that the owners of these claims were persons important to the history of Chuckwalla Valley. This information could also be ascertained through research of records at the BLM. It is also possible that these resources contain data important to history of the region. Therefore, staff assumed, and the Commission agreed, that these resources, sites SMP-H1005, SMP-H1007, and DS-327, are eligible for the CRHR. PSEGS impacts to these resources, if unavoidable, must be mitigated.

Military Resources

Three resources comprised of tank tracks, SMP-H-1026, SMP-H-2009, and SMP-H-2020, are considered ineligible for the CRHR.

SMP-H-1026 consists of three tank track segments (175, 280, and 350 feet in length). Track segment 1 represents vehicle tracks, eight feet wide with 18-inch treads. Track segments 2 and 3 are 9.4 feet wide with 24-inch treads. These match the width of M2 and M3 halftrack transports from WWII Desert Training Center activities. The tracks are most visible crossing a north-south-trending, rocky outcrop of younger desert pavement (lacking patination) on a stable alluvial fan.

SMP-H-2009 is comprised of one tank track segment, 680 feet long, 9 feet wide with 18-inch treads, matching the width of M2 and M3 halftrack transports from WWII Desert Training Center activities. The tracks are oriented northwest-southeast, crossing a stable alluvial fan with desert pavement. These tracks are in good condition.

SMP-H-2020 is comprised of a tank track segment, 250 feet long and 9 feet wide with approximately 20-inch treads. These are situated on desert pavement on the flat gravel terrace in the northwest quadrant of the PAA. These tracks have good integrity. Sheet wash has eroded the tracks to the northeast and southwest.

All three resources are associated with an important chapter in our country's history, WWII training for desert fighting in North Africa between 1942 and 1944. While these resources are in relatively good condition, they are common features in the area, and better examples can be found elsewhere. Moreover, the recordation already completed has exhausted the data potential of these resources. Staff determined, and the Commission agreed, that they are non-contributing elements of the greater, interconnected DTC/C-AMA Cultural Landscape previously nominated to the NRHP and assumed by staff to be eligible for the CRHR (see DTC/C-AMA Cultural Landscape/Historic District, below).

[26] http://www.geocommunicator.gov/GeoComm/index.shtm

Geological Survey Marker Feature

SMP-H-1025 consists of two U.S. Geological Survey/General Land Office survey markers made of two-by-four inch lumber, possibly dating to the early nineteenth century and subsequent updates. One, standing five feet tall, is situated at the corner of sections 3/4/33/34. The other, 175 feet to the southeast, is only one foot tall. A broken clear glass screw-top jar is found adjacent to this shorter marker. The base of the jar measures 2¾ inches in diameter and is embossed with "443-16A, H4." Modern pieces of lath, wired together, are lying on the ground near a single standing piece, likely related to a recent USGS survey in 2008.

DS-459 consists of a U.S. Geological Survey marker date-stamped 1955. The marker is comprised of a metal capped pipe embedded in the ground, surrounded by a rock pile of approximately 40 cobbles. A few pieces of deteriorating wood measuring approximately 4 feet in length are connected to the marker by metal wire.

Staff recommended, and the Commission agreed, that these resources were ineligible as they do not contribute to the broad patterns of history under Criterion 1 of the CRHR; they are not related to individuals important to history under Criterion 2 of the CRHR, respectively; and do not represent a distinct or unique construction style, type, or design (Criterion 3). Further, they are not likely to yield data important to history under Criterion 4.

Rock Cairn Sites

The cultural resources analysis in the September 2010 RSA recommended that four rock cairn sites identified on the original facility site (CA-RIV-9091, DS-326, DS-334, and DS-714) be determined ineligible for listing in the CRHR.

Prospecting Small Quartz Reduction Loci

The cultural resources analysis in the September 2010 RSA recommended that five prospecting small quartz reduction loci identified on the original facility site (DS-452, DS-454, DS-455, DS-458, and DS-716) be determined ineligible for listing in the CRHR.

Potential Elements of the Ironwood Historic Mining District

What staff presently knows of the historic Ironwood Mining District indicates that the boundary of the district falls within the view-shed of the amended project. The district begins to the northeast of the facility site in the Palen Mountains and ranges throughout the Palen, McCoy, Little Maria, and Granite mountains (**Cultural Resources Figure 7)**. There was a significant amount of mining activity in the Palen Mountains prior to the organization of the Ironwood district in approximately 1929 (see *Mining* subsection in the *Historic-Period Background* section, above).

Southwestern Palen Mountains Mining Area

Staff conducted an informal reconnaissance on July 16, 2013 of a limited sample of one area on the southwestern side of the Palen Mountains, herein referred to as the Southwestern Palen Mountains Mining Area. The reconnaissance was an approximately two-hour, meandering pedestrian transect through the mouth of an unnamed valley in

this remote area in 110 to 115 °F heat. The results of the reconnaissance were both definitive and imprecise; definitive in that the reconnaissance produced positive and intriguing cultural resources findings, and imprecise in that the reconnaissance was conducted with limited staff resources and was a very limited sampling of the project area of analysis.

The Southwestern Palen Mountains Mining Area was found to harbor substantive evidence of mining activity. Staff's brief, meandering transect through the mouth of the local valley led to the observation of several bedrock prospects of what appear to be copper-bearing ores, a number of mine adits, one adit complex with relatively extensive tailings of a talc-like mineral deposit and a wooden loading chute, and multiple apparent rock cairns that may be discovery monuments as well as mining claim boundary markers. Without further archival research or fieldwork, staff is presently unable to discern how many of the observed features pre- or post-date the establishment of the historic Ironwood Mining District in approximately 1929. Staff is further unclear whether any of the historical archaeological resources identified on the facility site for the amended project, the rock cairns, placer claims, or prospecting small quartz reduction loci, may also relate to the activity in that district. For the purpose of the present analysis, staff refers to the historic mining district, as a whole, as the Ironwood Historic Mining District. The Southwestern Palen Mountains Mining Area is a geographic subarea the constituent historical archaeological deposits and built-environment structures of which, individually or in groups, may contribute to the historical significance of the subarea and, more broadly, to the whole of the Ironwood Historic Mining District.

Absent any more specific data, staff recommends a technical regulatory assumption of CRHR eligibility under at least Criteria 1 and 4 for the portion of the cultural resource which staff tentatively designates here as the Ironwood Historic Mining District, that portion of the district within the viewshed of the proposed facility, and recommends the further technical assumption that the tentatively designated Southwestern Palen Mountains Mining Area would contribute to the CRHR eligibility of the district, should it ever be found, as a whole, to be so eligible.

Assessment of Project Impacts to CRHR-Eligible Archaeological Resources and Recommended Mitigation

The assessment here of the amended project's impacts to archaeological deposits and natural resources that are significant and qualify as historical resources includes some findings that carry over from the Energy Commission's original September 2010 decision and some new findings. The conclusions and conditions of certification from the original license that relate to the archaeological resources on the facility site stand, as applicable. The assessment of impacts to the archaeological and natural resource elements of the Chuckwalla Valley portion of the Pacific to Rio Grande Trails Landscape (PRGTL) are discussed below in the synthetic subsection that combines archaeological and ethnographic analysis on that portion of the subject landscape. For the Ironwood Historic Mining District, **CUL-17** would most likely mitigate the amended project's direct visual impacts to a portion of that assumed historical resource to a less than significant level.

ANALYSIS OF IMPACTS TO ETHNOGRAPHIC RESOURCES

Evaluation of Ethnographic Resources

Palen Dunes/Palen Lake

Theme

The Palen Dunes/Palen Lake is a TCP located on the floor of the Chuckwalla Valley, west of the Palen Mountains and southeast of the Coxcomb Mountains, the closest portion of which is less than one mile northeast of the PSEGS project area. This is a place that was, and continues to be, an important destination along the trail network within the Chuckwalla Valley. This place was occupied by groups temporarily as a stop along the trail, but also for more extended periods of time, most likely for logistical forays into the area for locally procured resources, such as mesquite and palo verde beans, salt brush, grasses and other hard seed plants, desert tortoise, and rabbits (Ritter 1981:7-8). There are reports of cremations at some of the recorded sites in the TCP. Site CA-RIV-201 (Rogers' designation C-82A, Koloseike Area A) was initially recorded by Malcolm Rogers at some point in the early 20th century as a large village site with a cremation area, ceramics, milling equipment, and many small projectile points (Singer 1984:45). Rogers' notes and site records were obtained from the Museum of Man, but there is no mention of cremations. However, Alan Koloseike re-examined the site in the early 1960s and did indicate the presence of a cremation (UCLA 2013). Another cremation was reported at CA-RIV-660 by Chester King in 1964, but Wilke (1973) suggests that the cremation may have been mistaken for what he identified as tortoise bone and shell fragments.

Since the Late Pleistocene, Palen Lake has only been ephemerally filled, and most of the water seeps into the sand dunes which surround the lake (Nials 2013:13), creating a habitat in which plant species that require more water than the typical creosote-scrub brush which is present at throughout the valley. These unique plants and the animals drawn to them, served as an important resource to prehistoric Native Americans, and the vast amount of extant artifacts throughout the TCP, especially in the blowout areas on the playa surface, continue to be culturally significant resources for contemporary Native Americans who continue to frequent this area. The presence of potential cremation sites is especially significant to contemporary Native American groups, and the protection of these resources is of the upmost importance to them. Visiting these resources helps to contribute to Native Americans' sense of cultural identity because it helps them to better understand the lifeways of their ancestors, and the artifacts serve as a direct link to their past. The Palen Dunes/Palen Lake TCP is a contributing element to the Chuckwalla Valley portion of the PRGTL.

There are several contributing elements to the Palen Dunes/Palen Lake TCP. These are identified in the table below.

Cultural Resources Table 8
Contributing Elements of the Palen Dunes/Palen Lake TCP

Element	Value(s)	Location	Additional information
Ephemeral lake and blowout areas on the playa surface	The water, supports wetland-like plant and animal life, sustained human travelers	Throughout the TCP area	
Trails	Serves as connection between places of importance; provides means by which contemporary Native Americans can identify currently unknown important places	Many trails from all directions pass through portions of the TCP	
Cremations	Burials and cremations are understood to be of the upmost sacredness for the descendants of those whose remains are identified	RIV-201 and at sites the currently designated ACEC	There is not definitive evidence as to whether the bone is human
Archaeological artifacts and features (i.e., lithics, hearths, ceramics, groundstone and milling slicks)	Evidence of Native American lifeways	Throughout Palen Dunes/Palen Lake TCP	

Period of Significance

The period of significance for the Palen Dunes/Palen Lake TCP spans from Time Immemorial, the beginning of Creation, up to 1936 when US Route 60-70 between Indio and Blythe became a paved highway.

Boundaries

The boundaries of the Palen Dunes/Palen Lake TCP are not precisely defined because the entire vicinity of the dunes and lake area and all of the contributing elements have not been inventoried. Based on the currently available information, staff considers the boundaries of the Palen Dunes/Palen Lake TCP to include the dry lake, and the

surrounding dunes and mesquite hummocks, encompassing the approximately 16 recorded sites in the vicinity of the dunes and lake, as well as several of the trail features which head towards and pass through the TCP.

Eligibility Criteria

The Palen Dunes/Palen Lake TCP is eligible under Criteria 1 at the regional and local level for its broad contributions to the unique historic events that shape Native American understanding of the their ancestor's lifeways and burial practices, and the deep oral tradition that is understood to be related to their ancestors. This place identifies one of several locations in the Chuckwalla Valley where Native American peoples lived, worked and possibly cremated deceased family members, and ecologically represents a unique wetland environment in this xeric landscape. On a regional level, the Palen Dunes/Palen Lake TCP contributes to the unique historical events surrounding travel, trade, and movement along the PRGTL, and was an important place in the trail network evidenced by the large number of temporary camps and associated resource processing artifacts which have been identified, as well as the importance of the area into the Proto-historic and Historic periods.

Criteria 4 is applicable to this TCP for the potential of this place to contribute to our understanding of the prehistory of the PRGTL in southeastern California and the prehistory of lifeways, trade, and movement in the Chuckwalla Valley.

Integrity

The integrity of the Palen Dunes/Palen Lake TCP has been visually and physically compromised by the establishment of a BLM road through the northern portion of the TCP and along the eastern margin of the area, refuse from historic and modern vehicle traffic through the region, looting and vandalism of some of the archaeological sites, natural environmental dune processes that affect the provenience of artifacts, refuse, tank tracks, and other military features associated with the DTC, historic and modern mining to the east in the Eagle Mountains and west in the Palen Mountains, the town of Desert Center, State Route 177, the I-10 corridor and the large transmission lines that parallel the freeway, as well as the recently constructed Red Bluff Substation and the Desert Sunlight Solar Farm. However, despite these intrusions the Palen Dunes/Palen Lake TCP is still relatively pristine and conveys the feeling of a repeated-use area in an ephemeral wetland environment amid an arid landscape, thus maintaining integrity of Association, Feeling, Setting, and Location.

Ford Dry Lake

Theme

The Ford Dry Lake is a TCP located on the floor of the Chuckwalla Valley, south-southeast of the Palen Mountains and southwest of the McCoy Mountains, about nine miles east of the PSEGS project area. This is a place that was, and continues to be, an important destination along the trail network within the Chuckwalla Valley. This place was occupied by groups temporarily as a stop along the trail, but also for more extended periods of time, most likely for logistical forays into the area for locally procured resources. Since the Early Holocene, Ford Dry Lake has only been

ephemerally present (Nials 2013:13), but as indicated by the many temporary camps and resource processing areas in the vicinity of Ford Dry Lake, this area served as an important resource to prehistoric Native Americans. The vast amount of extant artifacts throughout the TCP, especially in the blowout areas on the playa surface, continues to be culturally significant resources for contemporary Native Americans who continue to frequent this area. Some Native Americans regard the Ford Dry Lake area as a place with a high potential for cremation sites, and one site, identified during construction monitoring of the Genesis Solar Energy Project consisting of an inverted metate, has been interpreted as a possible cremation. The presence of potential cremation sites is especially significant to contemporary Native American groups, and the protection of these resources is of the upmost importance to them. The Ford Dry Lake TCP is a contributing element to the Chuckwalla Valley portion of the PRGTL.

There are several contributing elements to the Ford Dry Lake TCP. These are identified in the table below.

Cultural Resources Table 9
Contributing Elements of the Ford Dry Lake TCP

Element	Value(s)	Location	Additional information
Ephemeral lake and blowout areas on the playa surface	The water, when present, sustains plant and animal life, as well as human travelers	In the area around the dry lake bed	
Trails	Serves as connection between places of importance; provides means by which contemporary Native Americans can identify currently unknown important places	Many trails from all directions pass through portions of the TCP	Several of the trails which pass through the TCP head northeast to McCoy Spring
Cremations	Burials and cremations are understood to be of the upmost sacredness for the descendants of those whose remains are identified	In Unit 4 of the GSEP, within the TCP	There is not definitive evidence as to whether a cremation was present at the identified site
Archaeological artifacts and features (i.e., lithics, hearths, ceramics, groundstone and milling slicks)	Evidence of Native American lifeways	Throughout Ford Dry Lake TCP	

Period of Significance

The period of significance for the Ford Dry Lake TCP spans from Time Immemorial, the beginning of Creation, up to 1936 when US Route 60-70 between Indio and Blythe became a paved highway.

Boundaries

The boundaries of the Ford Dry Lake TCP are not precisely defined because the entire vicinity of the lake area and all of the contributing elements have not been inventoried. Based on the currently available information, staff considers the boundaries of the Ford Dry Lake TCP to include the dry lake, and the surrounding recorded archaeological sites in the vicinity of the lake, as well as several of the trail features which head towards and pass through the TCP.

Eligibility Criteria

The Ford Dry Lake TCP is eligible under Criteria 1 at the regional and local level for its broad contributions to the unique historic events that shape Native American understanding of the their ancestor's lifeways and burial practices, and the deep oral tradition that is understood to be related to their ancestors. This place identifies one of several locations in the Chuckwalla Valley where Native American peoples lived, worked and possibly cremated deceased family members, and ecologically represents a unique ephemeral lake environment in this xeric landscape. On a regional level, the Palen Dunes/Palen Lake TCP contributes to the unique historical events surrounding travel, trade, and movement along the PRGTL, and was an important place in the trail network evidenced by the large number of temporary camps and associated resource processing artifacts which have been identified, as well as the importance of the area into the Proto-historic and Historic periods.

Criteria 4 is applicable to this TCP for the potential of this place to contribute to our understanding of the prehistory of the PRGTL in southeastern California and the prehistory of lifeways, trade, and movement in the Chuckwalla Valley.

Integrity

The integrity of the Ford Dry Lake TCP has been visually and physically compromised by the establishment of a BLM road through the northern and western portion of the TCP, refuse from historic and modern vehicle traffic through the region, looting and vandalism of some of the archaeological sites, refuse, tank tracks, and other military features associated with the DTCCL, the Chuckwalla Valley State Prison, the I-10 corridor and the large transmission lines that parallel the freeway, as well as the recently constructed Red Bluff Substation and the Genesis Solar Energy Project. However, despite these intrusions the Ford Dry Lake TCP is still relatively pristine and conveys the feeling of a repeated-use area in an ephemeral lake environment amid an arid landscape, thus maintaining integrity of Association, Feeling, Setting, and Location.

McCoy Spring (CA-RIV-0132)

Theme

McCoy Spring is a TCP located in the western portion of the McCoy Mountains about 16 miles northeast of the PSEGS project area, and was, and continues to be, an important destination along the trail network within the Chuckwalla Valley. This place was occupied by groups temporarily as a stop along the trail, but also for more extended periods of time, most likely when the Colorado River seasonally overflowed its banks and groups retreated onto the mesa until the floods subsided (Bee 1963: 209, Castetter and Bell 1951: 70). McCoy Spring not only provided a source of water, but the canyon walls and boulders that surround the spring served as a medium for over 1,000 petroglyphs. In fact, rock art is often found near water sources. All rock art is understood to be a symbol of the sacred past, a pictorial representation of the events and activities of the Creator during sacred times (Bean et al. 1978:7-14) as well as a depiction of events during Proto-historic times, and the rock art panels at McCoy Spring contribute to the cultural identity of the Native Americans who still visit the site today. The McCoy Spring TCP is a contributing element to the Chuckwalla Valley portion of the PRGTL.

There are several contributing elements to the McCoy Spring TCP. These are identified in the table below.

Cultural Resources Table 10
Contributing Elements of the McCoy Spring TCP

Element	Value(s)	Location	Additional information
Spring	Water, supports oasis like plant and animal life, sustained human travelers		
Petroglyphs	Native American cultural identity; Evidence of spiritual communication	On canyon walls and boulders in McCoy Spring wash area	One of the petroglyphs is the largest cross design in eastern California, and possibly all of the southwest. Another petroglyph is the largest rain fringe (or lattice) design in eastern California
Trails	Served as connection between places of importance; provides means by which contemporary Native Americans can identify currently unknown important places	Emanate from the spring and head west into the valley, but also north of McCoy Mountains and west towards the Palen Mountains heading towards other spring locations and the main trail corridor	
Cleared circles and rock rings	Evidence of spiritual communication, ceremonial tutelage and trail navigation	Throughout site and along trail exiting spring	

Element	Value(s)	Location	Additional information
Archaeological artifacts and features (i.e., lithics, midden, ceramics, groundstone and milling slicks)	Evidence of Native American lifeways	Throughout McCoy Spring TCP	

Period of Significance

The period of significance for the McCoy Spring TCP spans from Time Immemorial, the beginning of Creation, up to the Present.

Boundaries

The boundaries of the McCoy Spring TCP are not precisely defined because the entire vicinity of the spring and all of the contributing elements have not been inventoried. Based on the currently available information, staff considers the boundaries of the McCoy Spring TCP to include the spring itself and the surrounding canyon walls and boulders, the trails emanating from the spring which head in numerous directions North, West and South.

Eligibility Criteria

The McCoy Spring TCP is eligible under Criteria 1 at the regional level for its broad contributions to the unique historic events that shape Native American understanding of the petroglyphs, cleared circles and rock rings in the TCP, and the deep oral tradition that is understood to be related to these spiritual communications. This place identifies one of several locations in the Chuckwalla Valley where Native American peoples found and commemorated their spiritual world, and helps to promote and preserve the spiritual life and well-being of the Native American people. McCoy Spring also contributes to the unique historical events surrounding travel, trade, and movement along the PRGTL, and was an important place in the trail network evidenced by the extensive petroglyphs, many of which exhibit a dark patina indicating substantial age, as well as the importance of the site into the Proto-historic and Historic periods.

This TCP is also eligible under Criteria 3 for its contributions to the production of the petroglyphs, cleared circles, and rock rings that exhibit a high degree of artistic value. Each petroglyph, cleared circle and rock ring is a unique expression of the creator of the communicative device and while there may be similar designs at other sites in the Chuckwalla Valley, these are not replicable and therefore of a unique craftsmanship.

Criteria 4 is applicable to this TCP for the potential of the site to contribute to our understanding of the prehistory of the PRGTL in southeastern California, the prehistory of the Chuckwalla Valley, and the prehistory of religion, and ritual and belief.

Integrity

The integrity of the McCoy Spring TCP has been visually and physically compromised by the construction of a cap over spring, modern and historic vandalism and looting, the historic mining and associated infrastructure in the vicinity, refuse, tank tracks, and other military features associated with the DTCCL, the I-10 corridor and the large transmission lines that parallel the freeway, the Chuckwalla Valley State Prison, as well as the recently constructed Genesis Solar Energy Project. However, despite these intrusions the McCoy Spring TCP is still relatively pristine and conveys the feeling of an oasis amidst an arid landscape, thus maintaining integrity of Workmanship, Association, Feeling, Setting, and Location.

Chuckwalla Spring (CA-RIV-0262)

Theme

Chuckwalla Spring is a TCP located in the northern portion of the Chuckwalla Mountains about 13 miles south of the PSEGS project area, and was, and continues to be, an important destination along the trail network within the Chuckwalla Valley. This place was occupied by groups temporarily as a stop along the trail, but also for more extended periods of time, most likely when the Colorado River seasonally overflowed its banks and groups retreated onto the mesa until the floods subsided (Bee 1963: 209, Castetter and Bell 1951: 70). Chuckwalla Spring not only provided a source of water, but the canyon walls and boulders that surround the spring served as a medium for many petroglyphs. In fact, rock art is often found near water sources. All rock art is understood to be a symbol of the sacred past, a pictorial representation of the events and activities of the Creator during sacred times (Bean et al. 1978:7-14) as well as a depiction of events during Protohistoric times, and the rock art panels at Chuckwalla Spring contribute to the cultural identity of the Native Americans who still visit the site today. The Chuckwalla Spring TCP is a contributing element to the Chuckwalla Valley portion of the PRGTL.

There are several contributing elements to the Chuckwalla Spring TCP. These are identified in the table below.

Cultural Resources Table 11
Contributing Elements of the Chuckwalla Spring TCP

Element	Value(s)	Location	Additional information
Spring	Water, supports oasis like plant and animal life, sustained human travelers		
Petroglyphs	Native American cultural identity; Evidence of spiritual communication	On canyon walls and boulders in Chuckwalla Spring wash area	
Trails	Served as connection between places of importance; provides means by which contemporary Native Americans can identify currently unknown important places	Recorded trails emanate from spring and head south towards Augustine Pass and Imperial County	
Cleared circles	Evidence of spiritual communication, ceremonial tutelage and trail navigation	Southern portion of the TCP, on alluvial fan	
Archaeological artifacts and features (i.e., lithics, ceramics, groundstone and milling slicks)	Evidence of Native American lifeways	Throughout Chuckwalla Spring TCP	

Period of Significance

The period of significance for the Chuckwalla Spring TCP spans from Time Immemorial, the beginning of Creation, up to the Present.

Boundaries

The boundaries of the Chuckwalla Spring TCP are not precisely defined because the entire vicinity of the spring and all of the contributing elements have not been inventoried. Based on the currently available information, staff considers the boundaries of the Chuckwalla Spring TCP to include the spring itself and the surrounding documented lithics, cleared circles, ceramics, and trails.

Eligibility Criteria

The Chuckwalla Spring TCP is eligible under Criteria 1 at the regional level for its broad contributions to the unique historic events that shape Native American understanding of the petroglyphs, cleared circles and rock rings in the TCP, and the deep oral tradition that is understood to be related to these spiritual communications. This place identifies one of several locations in the Chuckwalla Valley where Native American peoples found and commemorated their spiritual world, and helps to promote and preserve the spiritual life and well-being of the Native American people. Chuckwalla Spring also contributes to the unique historical events surrounding travel, trade, and movement along the PRGTL, and was an important place in the trail network evidenced by the extensive petroglyphs, many of which exhibit a dark patina indicating substantial age, as well as the importance of the site into the Protohistoric and Historic periods.

This TCP is also eligible under Criteria 3 for its contributions to the production of the petroglyphs, cleared circles, and rock rings that exhibit a high degree of artistic value. Each petroglyph, cleared circle and rock ring is a unique expression of the creator of the communicative device and while there may be similar designs at other sites in the Chuckwalla Valley, these are not replicable and therefore of a unique craftsmanship.

Criteria 4 is applicable to this TCP for the potential of the site to contribute to our understanding of the prehistory of the PRGTL in southeastern California, the prehistory of the Chuckwalla Valley, and the prehistory of religion, and ritual and belief.

Integrity

The integrity of the Chuckwalla Spring TCP has been visually and physically compromised by historic mines and mining roads, modern and historic vandalism and looting. The northern portion of the TCP looks out over the I-10 corridor and the large transmission lines that parallel the freeway. However, despite these intrusions the Chuckwalla Spring TCP is still relatively pristine and conveys the feeling of an oasis amidst an arid landscape, thus maintaining integrity of Workmanship, Association, Feeling, Setting, and Location.

Corn Spring (CA-RIV-032)

Theme

Corn Spring is a TCP located in the eastern portion of the Chuckwalla Mountains, about 6.75 miles southwest of the PSEGS project area, and was, and continues to be, an important destination along the trail network within the Chuckwalla Valley. This place was occupied by groups temporarily as a stop along the trail, but also for more extended periods of time, most likely when the Colorado River seasonally overflowed its banks and groups retreated onto the mesa until the floods subsided (Bee 1963: 209, Castetter and Bell 1951: 70). Corn Spring not only provided a source of water which Native Americans used to irrigate crops, in particular corn (Coffey 1967:53 cited in Gunther 1984:132), but the canyon walls and boulders that surround the spring served as a medium for over 600 petroglyphs. In fact, rock art is often found near water sources. All rock art is understood to be a symbol of the sacred past, a pictorial representation of the events and activities of the Creator during sacred times (Bean et al. 1978:7-14) as well as a depiction of events during Proto-historic times, and the rock art panels at Corn Spring contribute to the cultural identity of the Native Americans who still visit the site today. The Corn Springs TCP is a contributing element to the Chuckwalla Valley portion of the PRGTL.

There are several contributing elements to the Corn Spring TCP. These are identified in the table below.

Cultural Resources Table 12
Contributing Elements of the Corn Spring TCP

Element	**Value(s)**	**Location**	Additional information
Spring	Water, supports oasis like plant and animal life, sustained human travelers		
Petroglyphs	Native American cultural identity; Evidence of spiritual communication	On canyon walls and boulders in Corn Spring wash area	Some petroglyphs are reported to depict the early steam boats along the Colorado River, Others are said to be maps of the twists and turns of the Colorado River.
Trails	Served as connection between places of importance; provides means by which contemporary Native Americans can identify currently unknown important places	In Corn Springs wash and west into the canyon, also exiting the canyon and heading towards other spring locations and the main trail corridor	

Element	Value(s)	Location	Additional information
Corn horticulture	Evidence of Native American horticultural practices	In the vicinity of the spring itself	
Cleared circles and rock rings	Evidence of spiritual communication, ceremonial tutelage and trail navigation	Southwest portion of Corn Spring TCP, and on desert pavement exiting the canyon	
Archaeological artifacts and features (i.e., lithics, ceramics, groundstone and milling slicks)	Evidence of Native American lifeways	Throughout Corn Spring TCP	

Period of Significance

The period of significance for the Corn Spring TCP spans from Time Immemorial, the beginning of Creation, up to the Present.

Boundaries

The boundaries of the Corn Spring TCP are not precisely defined because the entire vicinity of the spring and all of the contributing elements have not been inventoried. Based on the currently available information, staff considers the boundaries of the Corn Spring TCP to include, from west to east, the segment of trail adjacent to Aztec Well and the surrounding canyon walls, following the wash east including the Corn Springs site extending east into the wash and desert pavement area, encompassing the trail segments heading east out of the canyon, as well as the petroglyph sites, cleared circles, rock rings, and trail shrines along these trails.

Eligibility Criteria

The Corn Spring TCP is eligible under Criteria 1 at the regional level for its broad contributions to the unique historic events that shape Native American understanding of the petroglyphs, cleared circles and rock rings in the TCP, and the deep oral tradition that is understood to be related to these spiritual communications. This place identifies one of several locations in the Chuckwalla Valley where Native American peoples found and commemorated their spiritual world, and helps to promote and preserve the spiritual life and well-being of the Native American people. Corn Spring also contributes to the unique historical events surrounding travel, trade, and movement along the PRGTL, and was an important place in the trail network evidenced by the extensive petroglyphs, many of which exhibit a dark patina indicating substantial age, as well as the importance of the site into the Proto-historic and Historic periods.

This TCP is also eligible under Criteria 3 for its contributions to the production of the petroglyphs, cleared circles, and rock rings that exhibit a high degree of artistic value. Each petroglyph, cleared circle and rock ring is a unique expression of the creator of the communicative device and while there may be similar designs at other sites in the Chuckwalla Valley, these are not replicable and therefore of a unique craftsmanship.

Criteria 4 is applicable to this TCP for the potential of the site to contribute to our understanding of the prehistory of the PRGTL in southeastern California, the prehistory of the Chuckwalla Valley, and the prehistory of religion, and ritual and belief.

Integrity

The integrity of the Corn Spring TCP has been visually and physically compromised by the modern developments at the site (i.e., a cap on the spring, the BLM campground, and the BLM access road), historic mines, mining roads, and a related historic cabin, the fact that the spring no longer flows, modern and historic vandalism and looting, and invasive tamarisk species. The eastern portion of the TCP looks out over the I-10 corridor and the large transmission lines that parallel the freeway, as well as the recently constructed Red Bluff Substation and the Genesis Solar Energy Project. However, despite these intrusions the Corn Spring TCP is still relatively pristine and conveys the feeling of an oasis amidst an arid landscape, thus maintaining integrity of Workmanship, Association, Feeling, Setting, and Location.

North Chuckwalla Petroglyph District (CA-RIV-01383)

Theme

The North Chuckwalla Petroglyph District is an NRHP-listed property located in the northern portion of the Chuckwalla Mountains about 4 miles west of the PSEGS project area, and was, and continues to be, an important destination along the trail network within the Chuckwalla Valley. This place was occupied by groups temporarily as a stop along the trail, and the myriad boulders that are encompassed in the TCP served as a medium for over 170 petroglyph panels. All rock art is understood to be a symbol of the sacred past, a pictorial representation of the events and activities of the Creator during sacred times (Bean et al. 1978:7-14) as well as a depiction of events during Proto-historic times, and the rock art panels at the North Chuckwalla Petroglyph District contribute to the cultural identity of the Native Americans who still visit the site today. The North Chuckwalla Petroglyph District TCP is a contributing element to the Chuckwalla Valley portion of the PRGTL.

There are several contributing elements to the North Chuckwalla Petroglyph District TCP. These are identified in the table below.

Cultural Resources Table 13
Contributing Elements of the North Chuckwalla Petroglyph District TCP

Element	Value(s)	Location	Additional information
Petroglyphs	Native American cultural identity; Evidence of spiritual communication	On boulders within the TCP area	
Trails	Served as connection between places of importance; provides means by which contemporary Native Americans can identify currently unknown important places	Within and adjacent to site. TCP is located along main trail corridor.	
Cleared circles and rock rings	Evidence of spiritual communication, ceremonial tutelage and trail navigation	Throughout TCP area	
Archaeological artifacts and features (i.e., lithics, ceramics, groundstone and milling slicks,	Evidence of Native American lifeways	Throughout TCP area	

Period of Significance

The period of significance for the North Chuckwalla Petroglyph District TCP spans from Time Immemorial, the beginning of Creation, up to the Present.

Boundaries

Based on the currently available information, staff considers the boundaries of the North Chuckwalla Petroglyph District TCP to include all of the boulders which have petroglyphs, the rock rings, cleared circles, trails, and archaeological artifacts and features in the vicinity of the TCP.

Eligibility Criteria

The North Chuckwalla Petroglyph District TCP is eligible under Criteria 1 at the regional level for its broad contributions to the unique historic events that shape Native American understanding of the petroglyphs, cleared circles and rock rings in the TCP, and the deep oral tradition that is understood to be related to these spiritual communications. This place identifies one of several locations in the Chuckwalla Valley where Native American peoples found and commemorated their spiritual world, and helps to promote and preserve the spiritual life and well-being of the Native American people. The North Chuckwalla Petroglyph District also contributes to the unique historical events surrounding travel, trade, and movement along the PRGTL, and was an important place in the trail network evidenced by the extensive petroglyphs, many of which exhibit a dark patina indicating substantial age, as well as the importance of the site into the Protohistoric and Historic periods.

This TCP is also eligible under Criteria 3 for its contributions to the production of the petroglyphs, cleared circles, and rock rings that exhibit a high degree of artistic value. Each petroglyph, cleared circle and rock ring is a unique expression of the creator of the communicative device and while there may be similar designs at other sites in the Chuckwalla Valley, these are not replicable and therefore of a unique craftsmanship.

Criteria 4 is applicable to this TCP for the potential of the site to contribute to our understanding of the prehistory of the PRGTL in southeastern California, the prehistory of the Chuckwalla Valley, and the prehistory of religion, and ritual and belief.

Integrity

The integrity of the North Chuckwalla Petroglyph District TCP has been visually and physically by the transmission lines that intersect the site and associated access roads, refuse, tank tracks, and other military features associated with the DTCCL, the 1-10 freeway, modern and historic vandalism and looting, the Town of Desert Center, State Route 177, as well as the recently constructed Red Bluff Substation and Desert Sunlight Solar Farm. However, despite these intrusions the North Chuckwalla Mountains Petroglyph District TCP is still relatively pristine and conveys the feeling an important location along a trail network, thus maintaining integrity of Workmanship, Association, Feeling, Setting, and Location.

North Chuckwalla Prehistoric Quarry District (CA-RIV-01814)

Theme

The North Chuckwalla Prehistoric Quarry District is a TCP located on the northeast slopes of the Chuckwalla Mountains, about 6.5 miles west of the PSEGS project area. This is a place that was, and continues to be, an important destination along the trail network within the Chuckwalla Valley. This place was occupied by groups temporarily as a stop along the trail for the acquisition of Aplite, a fine-grained intrusive felsic rock found throughout the quarry site that was desired for its fracturing qualities. In addition to a large number of lithic artifacts, rock shelters, rock rings, and trails are also present at the site, indicative of its multiple uses as a temporary camp and stop along the trail corridor in this portion of the Chuckwalla Valley. The vast amount of extant artifacts throughout the TCP continues to be culturally significant resources for contemporary Native Americans who frequent this area. Bean et al. (1978:5—54, 6-14, 6-24) has indicated that rock outcroppings, rock features, and trails are considered to be physical links to the past that possess significance to living peoples. Visiting these resources helps to contribute to Native Americans' sense of cultural identity because it helps them to better understand the lifeways of their ancestors, and the artifacts serve as a direct link to their past. The North Chuckwalla Prehistoric Quarry District TCP is a contributing element to the Chuckwalla Valley portion of the PRGTL.

There are several contributing elements to the North Chuckwalla Prehistoric Quarry District TCP. These are identified in the table below.

Cultural Resources Table 14
Contributing Elements of the North Chuckwalla Prehistoric Quarry District TCP

Element	Value(s)	Location	Additional information
Trails	Serves as connection between places of importance; provides means by which contemporary Native Americans can identify currently unknown important places	Many trails from all directions pass through portions of the TCP	
Archaeological artifacts and features (i.e., lithics, rock shelters, hearths, midden, ceramics, groundstone and milling slicks)	Evidence of Native American lifeways	Throughout North Chuckwalla Prehistoric Quarry District TCP	

Period of Significance

The period of significance for the North Chuckwalla Prehistoric Quarry District TCP spans from Time Immemorial, the beginning of Creation, up 1936 when US Route 60-70 between Indio and Blythe became a paved highway.

Boundaries

Based on the currently available information, staff considers the boundaries of the North Chuckwalla Prehistoric Quarry District TCP to consist of the at least 84 documented lithic reduction loci, in addition to the rock shelter and several of the trail features which head towards and pass through the TCP. The boundaries drawn by staff, accords with the boundary indicated on the DPR forms for the quarry district, CA-RIV-1814.

Eligibility Criteria

The North Chuckwalla Prehistoric Quarry District TCP is eligible under Criteria 1 at the regional and local level for its broad contributions to the unique historic events that shape Native American understanding of the their ancestor's lifeways, and the deep oral tradition that is understood to be related to their ancestors. This place identifies one of several locations in the Chuckwalla Valley where Native American peoples acquired lithic materials on a large scale. On a regional level, the North Chuckwalla Prehistoric Quarry District TCP contributes to the unique historical events surrounding travel, trade, and movement along the PRGTL, and was an important place in the trail network evidenced by the large number of temporary camps and associated resource processing artifacts which have been identified, as well as the importance of the area into the Protohistoric and Historic periods.

Criteria 4 is applicable to this TCP for the potential of this place to contribute to our understanding of the prehistory of the PRGTL in southeastern California and the prehistory of lithic technology, lifeways, trade, and movement in the Chuckwalla Valley.

Integrity

The integrity of the North Chuckwalla Prehistoric Quarry District TCP has been visually and physically compromised by the refuse from historic and modern vehicle traffic through the region, looting of some of the archaeological sites, refuse, tank tracks, and other military features associated with the DTCCL, historic and modern mining to the east in the Eagle Mountains and south in the Chuckwalla Mountains, the I-10 corridor and the large transmission lines that parallel the freeway, the town of Desert Center, State Route 177, as well as the recently constructed Red Bluff Substation and the Desert Sunlight Solar Farm. However, despite these intrusions the North Chuckwalla Prehistoric Quarry District TCP is still relatively pristine and conveys the feeling of a prehistoric lithic quarry, thus maintaining integrity of Association, Feeling, Setting, and Location.

Long Tank

Theme

Long Tank is a TCP located in the Alligator Rock ACEC, on northern slope of Chuckwalla Mountains, about 10 miles west of the PSEGS project area. This is a place that was, and continues to be, an important destination along the trail network within the Chuckwalla Valley. It was occupied by groups temporarily as a stop along the trail in order to access the granite tanks which are known to hold water and was a spot to stop for water along the Chuckwalla Valley trail corridor. This tank location is a culturally significant place for the contemporary Native American groups who visit the site. Moreover, Bean et al. (1978:5—54, 6-14, 6-24) has indicated that rock outcroppings, rock features, and trails are considered to be physical links to the past that possess significance to living peoples. Water places in particular are important resource locations for Native American groups. The Long Tank TCP is a contributing element to the Chuckwalla Valley portion of the PRGTL.

Period of Significance

The period of significance for the Long Tank TCP spans from Time Immemorial, the beginning of Creation, up to 1936 when US Route 60-70 between Indio and Blythe became a paved highway.

Boundaries

The boundaries of the Long Tank TCP are not precisely defined because the entire vicinity of the TCP and all of the contributing elements have not been inventoried. Based on the currently available information, staff considers the boundaries of the Long Tank TCP to include the granite tanks and the area around the tanks.

Eligibility Criteria

The Long Tank TCP is eligible under Criteria 1 at the regional and local level for its broad contributions to the unique historic events that shape Native American understanding of the their ancestor’s lifeways, and the deep oral tradition that is understood to be related to their ancestors. This place identifies one of several locations

in the Chuckwalla Valley where Native American peoples acquired water while travelling along this portion of the trail corridor in the Chuckwalla Valley. On a regional level, the Long Tank TCP contributes to the unique historical events surrounding travel, trade, and movement along the PRGTL, and was an important place in the trail network, as well as the importance of the area into the Protohistoric and Historic periods, indicated by its noted location by early miners in the region.

Criteria 4 is applicable to this TCP for the potential of this place to contribute to our understanding of the prehistory of the PRGTL in southeastern California and the prehistory of lifeways, trade, and movement in the Chuckwalla Valley.

Integrity

The integrity of Long Tank TCP has been visually and physically compromised by the refuse from historic and modern vehicle traffic through the region, looting of some of the archaeological sites, refuse, tank tracks, and other military features associated with the DTCCL, historic and modern mining to the northeast in the Eagle Mountains and south in the Chuckwalla Mountains, the I-10 corridor and the large transmission lines that parallel the freeway, the town of Desert Center, State Route 177, as well as the recently constructed Desert Sunlight Solar Farm. However, despite these intrusions the Long Tank TCP is still relatively pristine and conveys the feeling of a trailside water tank, thus maintaining integrity of Association, Feeling, Setting, and Location.

Alligator Rock

Theme

The Alligator Rock is a TCP located adjacent to the north portion of the Chuckwalla Mountains, about 9 miles west of the PSEGS project area. This is a place that was, and continues to be, an important destination along the trail network within the Chuckwalla Valley. This place was occupied by groups temporarily as a stop along the trail for the acquisition of Aplite, a fine-grained intrusive felsic rock found throughout the quarry site that was desired for its fracturing qualities. In addition to a large number of lithic artifacts, metates and ground stone tools, and trails are also present at this place, indicative of its multiple uses as a temporary camp and stop along the trail corridor in this portion of the Chuckwalla Valley. The vast amount of extant artifacts throughout the TCP continues to be culturally significant resources for contemporary Native Americans who frequent this area. Bean et al. (1978:5—54, 6-14, 6-24) has indicated that rock outcroppings, rock features, and trails are considered to be physical links to the past that possess significance to living peoples. Members of the La Cuna de Atzlan organization suggest that Alligator Rock has spiritual significance (Figueroa 2013b:3). The adjacent Chuckwalla Mountains were likely named for the desert reptile, the large Chuckwalla lizard[27] (Gunther 1984:115), and it is understood by these members that Alligator Rock is a part of these “Lizard Mountains”, and represents the lizard. Visiting these resources helps to contribute to Native Americans’ sense of cultural identity

[27] Gunther’s (1984:115) informant, Ms. Katherine Saubel of the Morongo Reservation, indicated that depending how the word “chuckwalla” is pronounced it can refer to either the lizard or a type of cactus.

because it helps them to better understand the lifeways of their ancestors, and the artifacts serve as a direct link to their past. The Alligator Rock TCP is a contributing element to the Chuckwalla Valley portion of the PRGTL.

There are several contributing elements to the Alligator Rock TCP. These are identified in the table below.

Cultural Resources Table 15
Contributing Elements of the Alligator Rock TCP

Element	Value(s)	Location	Additional information
Trails	Serves as connection between places of importance; provides means by which contemporary Native Americans can identify currently unknown important places	Many trails from all directions pass through portions of the TCP	
Archaeological artifacts and features (i.e., lithics, temporary camps, rock rings, ceramics, groundstone)	Evidence of Native American lifeways	Throughout Alligator Rock TCP	

Period of Significance

The period of significance for the Alligator Rock TCP spans from Time Immemorial, the beginning of Creation, up to 1936 when US Route 60-70 between Indio and Blythe became a paved highway.

Boundaries

The boundaries of the Alligator Rock TCP are not precisely defined because the entire vicinity of the TCP and all of the contributing elements have not been inventoried. Based on the currently available information, staff considers the boundaries of the Alligator Rock TCP to include the geologic landform itself and the several lithic reduction sites, rock rings, temporary camps, and trails in the vicinity of Alligator Rock.

Eligibility Criteria

The Alligator Rock TCP is eligible under Criteria 1 at the regional and local level for its broad contributions to the unique historic events that shape Native American understanding of the their ancestor's lifeways, and the deep oral tradition that is understood to be related to their ancestors. This place identifies one of several locations

in the Chuckwalla Valley where Native American peoples acquired lithic materials on a large scale. On a regional level, the Alligator Rock TCP contributes to the unique historical events surrounding travel, trade, and movement along the PRGTL, and was an important place in the trail network evidenced by the temporary camps and associated resource processing artifacts which have been identified, as well as the importance of the area into the Proto-historic and Historic periods.

Criteria 4 is applicable to this TCP for the potential of this place to contribute to our understanding of the prehistory of the PRGTL in southeastern California and the prehistory of lithic technology, lifeways, trade, and movement in the Chuckwalla Valley.

Integrity

The integrity of Alligator Rock TCP has been visually and physically compromised by the refuse from historic and modern vehicle traffic through the region, looting of some of the archaeological sites, refuse, tank tracks, and other military features associated with the DTCCL, historic and modern mining to the east in the Eagle Mountains and south in the Chuckwalla Mountains, the I-10 corridor and the large transmission lines that parallel the freeway, the town of Desert Center, State Route 177, as well as the recently constructed Red Bluff Substation and the Desert Sunlight Solar Farm. However, despite these intrusions the Alligator Rock TCP is still relatively pristine and conveys the feeling of a prehistoric lithic quarry, thus maintaining integrity of Association, Feeling, Setting, and Location.

Dragon Wash (CA-RIV-049)

Theme

Dragon Wash is a TCP located in the eastern portion of the Eagle Mountains about 14 miles west of the PSEGS project area, and was, and continues to be, an important destination along the trail network within the Chuckwalla Valley. This place was occupied by groups temporarily as a stop along the trail, and the canyon walls and boulders that surround the wash served as a medium for several dozen petroglyphs. In fact, rock art is often found near water sources. All rock art is understood to be a symbol of the sacred past, a pictorial representation of the events and activities of the Creator during sacred times (Bean et al. 1978:7-14) as well as a depiction of events during Protohistoric times, and the rock art panels at Dragon Wash contribute to the cultural identity of the Native Americans who still visit the site today. The Dragon Wash TCP is a contributing element to the Chuckwalla Valley portion of the PRGTL.

There are several contributing elements to the Dragon Wash TCP. These are identified in the table below.

Cultural Resources Table 16
Contributing Elements of the Dragon Wash TCP

Element	**Value(s)**	**Location**	Additional information
Wash	Water ephemerally ran through wash sustaining plant and animal life, which in turn aided human travelers		
Petroglyphs	Native American cultural identity; Evidence of spiritual communication	On canyon walls and boulders in Dragon Wash area	
Trails	Served as connection between places of importance; provides means by which contemporary Native Americans can identify currently unknown important places	Northeast of the opening to the wash on the desert pavement	
Prayer Seat	Evidence of spiritual communication, and Native American cultural identity	On boulder outcrop, just outside of the wash area	
Archaeological artifacts and features (i.e., temporary camps and milling slicks)	Evidence of Native American lifeways	Throughout Dragon Wash TCP	

Period of Significance

The period of significance for the Dragon Wash TCP spans from Time Immemorial, the beginning of Creation, up to the Present.

Boundaries

The boundaries of the Dragon Wash TCP are not precisely defined because the entire vicinity of the wash and all of the contributing elements has not been inventoried. Based on the currently available information, staff considers the boundaries of the Dragon

Wash TCP to include the wash and canyons that make up the mouth of the wash and the large rock outcrops less than 0.5 miles southwest of the wash.

Eligibility Criteria

The Dragon Wash TCP is eligible under Criteria 1 at the regional level for its broad contributions to the unique historic events that shape Native American understanding of the petroglyphs in the TCP, and the deep oral tradition that is understood to be related to these spiritual communications. This place identifies one of several locations in the Chuckwalla Valley where Native American peoples found and commemorated their spiritual world, and helps to promote and preserve the spiritual life and well-being of the Native American people. Dragon Wash also contributes to the unique historical events surrounding travel, trade, and movement along the PRGTL, and was an important place in the trail network evidenced by the extensive petroglyphs, many of which exhibit a dark patina indicating substantial age, as well as the importance of the site into the Protohistoric and Historic periods.

This TCP is also eligible under Criteria 3 for its contributions to the production of the petroglyphs that exhibit a high degree of artistic value. Each petroglyph is a unique expression of the creator of the communicative device and while there may be similar designs at other sites in the Chuckwalla Valley, these are not replicable and are therefore of a unique craftsmanship.

Criteria 4 is applicable to this TCP for the potential of the site to contribute to our understanding of the prehistory of the PRGTL in southeastern California, the prehistory of the Chuckwalla Valley, and the prehistory of religion, and ritual and belief.

Integrity

The integrity of the Dragon Wash TCP has been visually and physically compromised by the construction of a transmission line and associated access road that bisects the TCP, historic mining and mining roads associated with Eagle mine, and historic vandalism. The TCP looks out over the I-10 corridor and the large transmission lines that parallel the freeway, the town of Desert Center, State Route 177, as well as the recently constructed Red Bluff Substation and the Desert Sunlight Solar Farm. However, despite these intrusions the Dragon Wash TCP is still relatively pristine and conveys the feeling of an oasis amidst an arid landscape, thus maintaining integrity of Workmanship, Association, Feeling, Setting, and Location.

San Pascual Well

Theme

The San Pascual Well TCP is located in a wash on the valley floor of the Chuckwalla Valley, and is about 5 miles northwest from the PSEGS project area. The Native American well was initially relocated during the Romero-Estudio expedition in 1823-1824 while attempting to establish a route for Euro-Americans to cross the Colorado Desert and more efficiently connect the Los Angeles area to the Tucson region. The expedition named the well San Pascual, and Estudio's entry in his diary states "we found signs of basket-making by the Indian women on several occasions, bones of horses and pieces of ollas" (Bean and Mason 1962:41). Bean and Mason (1962:41, footnote 22) suggest that this well was in the Desert Center area based on the landmarks provided in the diary, and the fact that the expedition was likely headed for Palen Pass. A General Land Office (GLO) map from 1856 identifies "a well 45 feet deep of fair water in this quarter section" (Brown 1856). This well location is a culturally significant place for the contemporary Native American groups who visit the site. Water places in particular are important resource locations for Native American groups. The San Pascual Well TCP is a contributing element to the Chuckwalla Valley portion of the PRGTL.

Period of Significance

The period of significance for the San Pascual Well TCP spans from Time Immemorial, the beginning of Creation, up to 1936 when US Route 60-70 between Indio and Blythe became a paved highway.

Boundaries

The boundaries of the San Pascual Well TCP are not precisely defined because the entire vicinity of the well and all of the contributing elements has not been inventoried. Based on the currently available information, staff considers the boundaries of the San Pascual Well TCP to include the redacted.

Eligibility Criteria

The San Pascual Well TCP is eligible under Criteria 1 at the regional and local level for its broad contributions to the unique historic events that shape Native American understanding of their ancestor's lifeways, and the deep oral tradition that is understood to be related to their ancestors. This place identifies one of several locations in the Chuckwalla Valley where Native American peoples acquired water while travelling along this portion of the trail corridor in the Chuckwalla Valley. On a regional level, the San Pascual Well TCP contributes to the unique historical events surrounding travel, trade, and movement along the PRGTL, and was an important place in the trail network, as well as the importance of the area into the Proto-historic and Historic periods, indicated by its use and mention by early explorers in the region.

Criteria 4 is applicable to this TCP for the potential of this place to contribute to our understanding of the prehistory of the PRGTL in southeastern California and the prehistory of lifeways, trade, and movement in the Chuckwalla Valley.

Integrity

The integrity of the San Pascual Well TCP has been visually and physically compromised by the construction of the Desert Center airfield and Chuckwalla Raceway, refuse from historic and modern vehicle traffic through the region, natural environmental dune processes that affect the provenience of artifacts, refuse, tank tracks, and other military features associated with the DTCCL, historic and modern mining to the east in the Eagle Mountains, the I-10 corridor and the large transmission lines that parallel the freeway, the town of Desert Center, State Route 177, as well as the recently constructed Red Bluff Substation and the Desert Sunlight Solar Farm. However, despite these intrusions the San Pascual Well TCP is still relatively pristine and conveys the feeling of a repeated-use area in an ephemeral wetland environment amid an arid landscape, thus maintaining integrity of Association, Feeling, Setting, and Location.

All CRHR-Eligible Ethnographic Resources Subject To Potential Project Impacts

Staff recommends that all 11 ethnographic resources/TCPs evaluated above are eligible for the CRHR, and therefore would be subject to direct visual impacts from the construction, operation, and decommissioning of the PSEGS.

Assessment of Project Impacts to CRHR-Eligible Ethnographic Resources and Recommended Mitigation

Staff recommends that the 11 TCPs, all contributing elements to the Chuckwalla portion of the Pacific to Rio Grande Trails Landscape (PRGTL), will be considered mitigated to the extent possible, by considering mitigations to the PRGTL. The assessment of impacts to the ethnographic resource elements of the Chuckwalla Valley portion of the PRGTL are discussed below in the synthetic subsection that combines archaeological and ethnographic analysis on that portion of the subject landscape.

ANALYSIS OF IMPACTS TO HISTORIC PERIOD BUILT-ENVIRONMENT RESOURCES

Evaluation of CRHR Eligibility of Individual Historic-Period/Built-Environment Resources

The following information concerning the resources on the project site has been taken from the 2010 RSA that was completed for the original license and DPRs submitted by the original applicant.

Electric Power Transmission Line

One resource, related to electric power, SMP-H-1024, is a 1.75-mile segment of the Blythe-Eagle Mountain 161-kV transmission line and its service road that cuts approximately diagonally across the southwest corner of the proposed PSEGS plant site. The power line dates to the late 1950s. The segment consists of eleven sets of H-frame wooden supports consisting of two poles spaced about 15 feet apart with metal crossbeams at the top and ceramic insulators), carrying three conductors. Distances between supports are 775 feet. Many of the supports bear tags or markings indicating their date. Among these tags are nails with either “57” or “65” on the head. Other tags indicate that some of the poles were replaced in 2002, bearing the support numbers or inspection tags or markings indicating their date. Among these tags are nails with either “57” or “65” on the head. Other tags indicate that some of the poles were replaced in 2002, bearing the pole numbers or inspection tags that read “PMC 2002 – Visual” or “PMC 2002 – UFUME –IMPEL”. A graded access road parallels the line.

Generally speaking, electrical transmission and distribution facilities, as a mature technology, by themselves rarely meet the eligibility criteria for National Register listing. Typically, those that are determined National Register eligible achieve that status by way of their association with other historically significant facilities (eligible under Criterion A). Borrowed from telegraph transmission technology, wood-pole support structures such as those used in the 161-kV Blythe-Eagle Mountain transmission line have been used for electrical transmission or distribution lines from the outset, and the technology has changed very little. The common and indistinctive nature of wood-pole transmission or distribution line structures disqualifies them as potentially National Register eligible under Criterion C: they are purely functional and utilitarian in use and common in appearance.

Staff recommended, and the Commission agreed, that the 161-kV Blythe-Eagle Mountain transmission line is also not eligible for inclusion in the CRHR. Evaluated under Criterion 1, this linear resource is not associated with events that have made a significant contribution to broad patterns in our history. Rather it represents a common trend within the context of development in the United States after World War II. Research did not indicate that this transmission line was associated with any historically significant persons, and so it does not appear to be eligible under Criterion 2. Under Criterion 3, this transmission line does not embody a distinctive type, period, or method of construction. Instead, it represents a fairly standardized type and construction method shared with telegraph lines. This resource is also not eligible under Criterion 4 because it is unlikely to yield information important to history.

The following resources are being evaluated as they are located within the revised and enlarged PAA for the PSEGS 2013 Project Amendment. The following resources, as well as the transmission lines noted above, are located on Cultural Resources Figure 8, Built Environment Resources. This figure identifies the built environment resources located within the expanded PAA.

Town of Desert Center

The town of Desert Center is located in eastern Riverside County approximately half way between Blythe and Indio. Eight of the 40 built-environment resources identified are associated with the Town of Desert Center: the Desert Center Café (P-33-5717), the Desert Center Post Office (P-33-5718), Stump Ranch (P-33-5719), Desert Steve Ragsdale Memorial Plaque and Grave (P-33-5720), "Hollywood Cabins" (P-33-5721), the Ragsdale House (P-33-6832), the Old School House (P-33-6833), and the Desert Center Red Brick School Building (P-33-21002).

The following paragraph, briefly describing the history of Desert Center was excerpted from the Desert Center District DPR form prepared by AECOM for the project owner as a part of the Class II and Class III Cultural Resources Survey Repot for the Palen Solar Electric Generating System (2013).

Steven Ragsdale, founder of Desert Center, was born on June 16, 1882. He spent the early decades of his life as a cotton farmer and preacher in Arkansas. He and his wife Lydia eventually quit the cotton business and moved to California. In 1921, Ragsdale moved his family to Riverside County to the original Desert Center town site. He leased the land from Mr. Grundyke. The parcel was located along Blythe-Mecca Road approximately 5 miles north of the current town site and included a well, windmill and living quarters. When Desert Center was founded the average travel time between Blythe and Mecca was approximately nine hours on a stretch of road with no services catering to tourists. Ragsdale opened a small service station and tow service and offered free water to travelers. In 1925 the state rerouted the road connecting the Palo Verde and Coachella Valleys five miles south, paved it, and named it U.S. Route 60. Ragsdale relocated as well to the present site of Desert Center. He built the café with an attached service station and garage. He also installed a pool next to the café. Later, Ragsdale purchased several cabins from the Desert Center Army Air Field and moved them to town. By 1927, Ragsdale purchased 700 acres for his growing community, which, by then, included the store and post office. Boosts to the Desert Center economy in the 1940s included the construction of the Colorado River Aqueduct, the opening of Henry J. Kaiser's Eagle Mountain Iron Ore mine, and the establishment of the DTC.

Because of the evolution of the town from its current location's beginnings in 1927 through the addition of the Army Air Field buildings to the town after the closure of the DTC, the period of significance is from 1927 to 1950. This is in agreement with the owner's conclusions. However, staff does not believe there is enough information provided to reach a conclusion that the district is not eligible for listing on the CRHR/NRHP for significance at either a local or state-wide level.

Despite the deteriorating condition of the residential buildings associated with the early settlement of Desert Center, staff finds that the commercial core retains a high degree of integrity including location, design and materials.. Just as early prehistoric and historic trail networks across the desert were connected by springs, and later wells, the Town of Desert Center provided an important roadside "pit stop" for the desert traveler in the early 20th century where gas, water, and other supplies could be obtained. Presumably, the café and post office originally straddled the highway (paved in 1936),

on what is now known as Ragsdale Road. It would have been an obvious stop for fuel, food and water to early automobile travelers in a rural and open setting. Views of the surrounding mountains and broad alluvial fans and the entire Chuckwalla Valley would have been unbroken, except by the low-profile original buildings of Desert Center and vegetation. There are a few modern visual intrusions in the surrounding landscape that have compromised the larger setting, feeling and association as it relates to the period of significance. The introduction of Interstate 10inherently changed Desert Center's relationship to motorists and the introduction of modern transmission lines and cell towers to the general setting, and other utilitarian structures used by CalTrans and an automobile salvage yard adjacent to the central core have also affected the setting, feeling and association with the broader environment. The core buildings, which might be eligible as a district with further evaluation, have retained their spatial relationships to the original route of travel. For these reasons, staff feels the core structures, when considered as a district, may be eligible for inclusion on the CRHR under Criterion 1, as a representative of roadside development in the early automobile age.

Eagle Mountain – Mine, Company Town, and Railroad

Three of the built-environment resources are associated with Eagle Mountain; the Eagle Mountain Mine, Eagle Mountain Railroad and the town of Eagle Mountain, Collectively referred to as Eagle Mountain, the town and mine complex is located approximately 11 miles north of Desert Center. As can be seen on Cultural Resources Figure 8, only the Eagle Mountain Railroad is inside the established PAA for the PSEGS project, whereas the town and mine are outside. However, Eagle Mountain is discussed here to add context for the Eagle Mountain Railroad.

The site is 56.92 acres and includes an iron ore mine, offices, mining equipment, a railroad yard, a residential community, stores, a school, and a playground. (Metcalfe 1982[28]).” Eagle Mountain is represents a company town. At one time, more than 4,000 people were employed in the operation. The town included schools, civic facilities, 416 rental houses, 185 trailers, 383 dormitory rooms and 32 apartments (FERC/FEIS-F-0238). The mine closed in 1983. Much of the housing stock was removed, left vacant or vandalized. It is largely a ghost town today. The mine itself is behind locked gates.

The County of Riverside Historical Marker reads:

> “The Iron Chief, Black Eagle and other mines produced gold at Eagle Mountain between 1881 and 1900 from ores containing as much as 54 percent iron. L.S. Barnes secured options and sold the mines to Southern Pacific Railroad in 1909. Kaiser Steel Company bought them in 1944, built a feeder railroad, and began shipping Eagle Mountain iron ore to its Fontana plant in 1948.”

[28] Heather Metcalfe, Riverside County Historical Commission, Eagle Mountain DPR, March 27, 1982.

In 1947, Henry J. Kaiser, an industrialist who established the Kaiser Shipyard, Kaiser Steel and Kaiser Aluminum, and later founded Kaiser Permanente health care system, was building a portion of the Colorado River Aqueduct in the vicinity of Desert Center and established the Eagle Mountain Iron Ore mine. The Eagle Mountain Ore Mine supplied iron ore for the steel manufacturing plant in Fontana and also shipped ore to Long Beach to be sold elsewhere. The Eagle Mountain Railroad (EMRR) conveyed the ore shipments to the Southern Pacific Railroad at the Salton Sea until 1986, when it ceased operation. Staff noted in field visits that many features of the EMRR are extant, including a trestle bridge, rails and ties as well as an at-grade crossing with original wooden members at Eagle Mountain Road. The mine, company town and railroad all date to 1948. The period of significance for the railroad includes all the years of the mine's operation from Kaiser's initialization of the operation in 1948 to1986 when the last rail shipments were made. Track dates from a 2005 survey in a nearby location were found to be 1963, 1969 and 1970 and the width is generally 61inches (5'1") (Eckhardt 2005).

According to Meiser (Meiser 2013), the route of the railroad followed a 19th-century gold rush trail.

The Eagle Mountain Railroad was featured in a number of movies, including the Professionals (1966) and Tough Guys (1986). The railroad line suffered some damage in flash floods in 2003. Some track was damaged but apparently all the bridges held up under the strain of the flood waters. The owner at the time, Kaiser Ventures, began some repairs from 2003 to 2005 but repairs were not completed at that time.

The railroad is significant for its association with the Eagle Mountain Mine and company town (P-33-6913) as well as the Kaiser Steel industrial complex and the Kaiser ship building industries. Because of this widespread contribution to industry, commerce and development and direct association with the Kaiser Eagle Mountain Mine, Meiser concludes that the Eagle Mountain Railroad is eligible for listing on the NRHP/CRHR under Criterion C/1. Meiser further concludes that the railroad does not retain sufficient integrity to convey its significance in connection with Eagle Mountain. Staff doubts that the damage described in other documents is enough to destroy its apparent and easily understood connection to the Eagle Mountain Mine. Staff field observations found readily recognizable sections of the railroad and even images uploaded to Google Earth manifest a great deal of legibility and continuity of the railroad. Staff doubts that the damage alone is enough to render the railroad ineligible for listing on the CRHR/NRHP.

Colorado River Aqueduct and Eagle Mountain Pumping Station

The Colorado River Aqueduct is a 242-mile long water conveyance system that extends from the Colorado River at the Whitsett Intake Pumping Plant at Lake Havasu on the California-Arizona boarder to Lake Mathews (formerly Cajalco Reservoir) in Riverside County, California. The system includes two reservoirs, five pumping stations, 63 mi of canals, 92 miles of tunnels, and 84 miles of buried conduit and siphons. The Colorado River Aqueduct has been recommended eligible for both the NRHP and the CRHR under Criterion A/1 and C/3 (Neves and Goodman—2000; Hamilton and Beedle—

2005). The Colorado River Aqueduct is a National Historic Engineering Landmark. The portion within the PAA is largely underground, surfacing at the Eagle Mountain Pumping Station.

Located within the PAA, the Eagle Mountain Pumping Station, is significant as a contributing element to the Colorado River Aqueduct as one of five pumping stations. In addition, the Eagle Mountain Pumping Plant has been found individually eligible for listing on the NRHP/CRHR under Criterion C/3 for its Art Deco architectural style (Meiser 2013). It was found to have retained its integrity in all seven aspects. The period of significance is the years in which it was built, 1936-1939. Staff concurs that it is eligible for listing on the NRHP/CRHR for its architectural style and association with an engineering landmark.

Assessment of Project Impacts to Historic-Period/Built-Environment CRHR-Eligible Resources and Recommended Mitigation

During the siting case for the original project, staff recommended the Blythe-Eagle Mountain 161-kV transmission line as ineligible for listing in the CRHR, so no mitigation was recommended for PSEGS impacts to that resource. The Energy Commission's original CRHR eligibility determination stands for the amended project.

Additional resources that have been identified in the expanded PAA that could be impacted by the PSEGS include the Town of Desert Center, the Eagle Mountain Railroad, and the Colorado River Aqueduct, including the Eagle Mountain Pumping Station. These resources have been described above and the following provides an assessment of potential impacts.

Just as early prehistoric and historic trail networks across the desert were connected by springs, and later wells, the Town of Desert Center provided an important "pit stop" for the desert automobile traveler in the early 20th century where gas, water, and other supplies could be obtained. Based on the limited information available staff believes that, at a minimum, the town is eligible for the local and CRHR registers based on its significance as a roadside stop for early 20th Century automobile travelers and, therefore, a historical resource pursuant to CEQA. The spatial relationships to the original highway are intact (location) as well as the design, workmanship, and materials of the structures and therefore, even with the lack of integrity of the broader setting, feeling and association from the period of significance, the town's eligibility as a desert oasis along a 90-mile stretch of desert, half way between Blythe and Indio, in the early age of the automobile is still discernible. The PSEGS and related transmission facilities, approximately 7 miles away, would not have a significant visual impact on the localized setting to such a degree that staff believes its status as an eligible historical resource could be jeopardized. Therefore, no mitigation is recommended to address any impacts from the PSEGS.

The Colorado River Aqueduct has been recommended, in the past, as eligible for both the NRHP and the CRHR under, respectively, Criteria A and C, and Criteria 1 and 3. The Eagle Mountain Pumping Station is significant as a contributing element to the Colorado River Aqueduct as one of five pumping stations, and as an individual historical resource for its architectural style and design (National Register Criterion C and California Register Criterion 3). While staff believes that the power towers of the PSEGS would be at least partially visible from the Eagle Mountain Pumping Station and portions of the aqueduct, the distance of the resources from the amended project diminishes the potential visual impact The potential visual impact of PSEGS on the subject portions of the aqueduct or on the pumping station would not be of such a magnitude as to substantively degrade the ability of either to convey their respective associative, or design and construction values. Key aspects of the resources' integrity, the respective setting, feeling, and association for each resource, would largely remain intact. As such, staff believes that the potential visual impacts of PSEGS on these resources would be less than significant. Staff consequently recommends no mitigation for these potential impacts. Staff has reached a similar conclusion with regard to the potential impacts of PSEGS on the Eagle Mountain Railroad. The distance of the amended project from the railroad would not degrade the ability of the resource to convey its significance either as a contributing element to Kaiser's Eagle Mountain Mine industrial complex (Eagle Mountain Mine, town of Eagle Mountain, and Eagle Mountain Railroad) or as an individual historical resource. Staff therefore recommends no mitigation for what it believes would be PSEGS' less than significant visual impact on the Eagle Mountain Railroad.

ANALYSIS OF IMPACTS TO CULTURAL LANDSCAPES

Staff's original 2009–2010 analysis of the Palen Solar Power Project (PSPP) identified and evaluated as eligible for listing in the CRHR two cultural landscapes that overlap the proposed PSEGS facility site. These landscapes are the Prehistoric Trails Network Cultural Landscape (PTNCL), which the Pacific to Rio Grande Trails Landscape (PRGTL) now subsumes and the Desert Training Center Cultural Landscape (DTCCL), which remains unchanged. Both landscapes are multi-component cultural resources that variably represent mosaics of contributing elements that may include single archaeological deposits, ethnographic places, or built-environment resources, thematic subgroups or districts of such deposits, places, or resources, thematically pertinent biological populations, or mineral or water resources, and broad expanses of the land that physically, visually, and intellectually binds the unique suite of elements for each mosaic.

The PRGTL includes ethnographic, archaeological, and natural resource elements that potentially contribute to the historical significance which was recommended previously for the PTNCL and which staff recommends here for the broader PRGTL. These different elements are articulated above in the subsections on ethnographic and archaeological resources. A synthetic discussion of all of the proposed elements that now constitute what has become the broader landscape, a discussion of the propriety of a technical assumption of California Register of Historical Resources (CRHR) eligibility for the many potential elements that may contribute to the historical significance of the

PRGTL, an assessment of the amended project's effects on the landscape and its potential cultural and natural elements, and proposals for the mitigation of those effects on it follow.

The DTCCL includes both archaeological and built-environment resource elements that potentially contribute to the historical significance which staff previously recommended for the landscape. Staff finds no reason to reevaluate the historical significance of the DTCCL, so the Energy Commission's CRHR eligibility determination for the resource in the original decision for the project stands. In contrast to the PTNCL and its reconsideration as part of the PRGTL, the conceptual framework for the DTCCL remains largely unchanged from its initial presentation in the original staff analysis of 2009-2010.

Regulatory Context for Cultural Landscape Concept

Although the term appears to be a straightforward derivative of common speech, the term "cultural landscape" actually denotes a formal type of cultural resource. A cultural landscape consists of a "geographic area, including both natural and cultural resources, associated with a historic event, activity or person" (NPS 1996). The Department of the Interior's Historic Preservation Planning Program, a division of the National Park Service (NPS), has defined four overlapping categories of cultural landscapes: historic designed, historic vernacular, historic site, and ethnographic. Historic designed landscapes are deliberate artistic creations, reflecting recognized styles, and are often associated with important builders, building trends, or events in the history of the construction of these kinds of landscapes. Historic vernacular landscapes illustrate people's values and attitudes towards the land and reflect patterns of settlement, use, and development over time. Historic sites are significant for their associations with important events, activities, and persons. Existing features and conditions are defined and interpreted in terms of what happened there at particular times in the past. Finally, ethnographic landscapes can be spaces rather than things that can be owned. These spaces or places are given meaning through their association with local and regional histories, cultural identities, beliefs, and behaviors. Ethnographic landscapes can include horizons, unmarked spiritual corridors, and places of connection between the earth's surface and the upper and lower realms. While these kinds of landscapes are often associated with Native Americans, they can be associated with any cultural group or belief system. Cultural landscapes can be determined eligible and nominated for inclusion on the NRHP as either sites or districts. As such, these landscapes can be unified wholes or groups of discontiguous elements (Evans et al. 2001; NPS 1996). California Office of Historic Preservation's Statewide Historic Preservation Plan, 2013-2017, advocates for analyzing archaeological and ethnographic information together in the identification and evaluation phases of Cultural Landscape documentation. Furthermore, OHP has specifically called out a need for cultural resources professionals working on renewable energy projects to shift focus from the site level to the landscape level of assessment (OHP 2013:16). The use of the term "cultural landscape" in relation to both the PTNCL and the DTCCL reflects these historic preservation concepts, which are applicable to the CRHR and to the analysis of historical resources under CEQA.

Evaluation of CRHR Eligibility of Individual Cultural Landscapes

Pacific to Rio Grande Trails Landscape (PRGTL) (Formerly, Prehistoric Trails Network Cultural Landscape (PTNCL))

Prehistoric Trails Network Cultural Landscape

The Prehistoric Trails Network Cultural Landscape (PTNCL) is a cultural resource identified during development of the PSPP RSA. This landscape will be subsumed into a larger landscape (the PRGTL). This section provides an overview of the PTNCL as it is described in the PSPP RSA and is the language included in the PSEGS PSA prior to staff development of the PRGTL.

The Energy Commission has designated a noncontiguous cultural landscape (a.k.a. "historic district") that incorporates prehistoric archaeological sites associated with the Halchidhoma Trail (CA-RIV-0053T), referred to here as the Prehistoric Trails Network Cultural Landscape (PTNCL). This landscape consists of important destinations in the Colorado Desert near Blythe, California, the network of trails that tie them together, and the features and sites associated with the trails. The foundation of this cultural landscape is a core group of 224 sites originally recorded by McCarthy (1993).

In the 1990s McCarthy (1993) and a group of volunteers recorded 20 km of the Halchidhoma Trail (CA-RIV-0053T) as it curves around the southern and western side of the McCoy Mountains leading from the Blythe Intaligos (geoglyphs) through the Chuckwalla Valley. They identified 224 trail-associated sites and subsidiary trails associated with the Halchidhoma Trail. McCarthy's report provides the basis for preliminary definitions of the boundaries, period of significance, thematic associations, and property types of the PTNCL.

The NRHP guidance for districts and cultural landscapes requires identifying certain characteristics, including boundaries, one or more periods of significance, thematic associations, and property (resource) types. The boundaries of the PTNCL need to be refined as additional pieces are identified, but in broad terms the boundary extends along the length of the historically known route of the Halchidhoma Trail, from where it begins near Blythe at the Colorado River, continuing to the west through the Chuckwalla Valley towards modern Los Angeles, with a suggested width of 10 miles. The period of significance also needs to be refined, but it appears that the prehistoric trail systems of southern California were used for thousands of years. Therefore, as a preliminary measure, Energy Commission staff defines the period of significance as the entire prehistoric and early historic periods. The thematic associations currently include travel, trade, and ritual. Resource exploitation, particularly the collection of stone tool and ground stone raw materials, is also an important theme. The PTNCL site types are divided into three categories: destinations, trails, and trail-associated sites or features[29].

[29] The list of property types included in the PTNCL is not comprehensive; it should be added to as needed as new patterns are discovered.

Destinations primarily include water sources, but also include residential, religious, and resource-collection sites. Water-oriented destinations include natural features such as rivers, springs, lakes, rainwater tanks, as well as man-made wells. Residential sites include villages and camps with evidence of a full range of activities. Religious sites include geoglyphs and petroglyphs. The importance of particular destinations is indicated by the web of multiple trails that converge on certain places, often mountain passes or water sources.

Trails can either be created by the movement of traveling feet or formally constructed. They average 30 cm in width and can be traced for many km, interrupted only by gullies and washes. Trails are usually the shortest and most convenient routes from one point on the landscape to another.

Trail-associated sites or features could include: concentrations of ceramics/pot drops, cleared circles, rock rings, rock clusters, rock cairns, rock alignments, petroglyphs, and geoglyphs. When the trail itself is not preserved, its route can often be approximately traced by distinctive patterns of trail-associated sites and features.

Energy Commission determined that the PTNCL is eligible for listing on the NRHP under Criteria A and D and for the CRHR under Criteria 1 and 4. Under Criterion A/1, a resource is eligible if it is associated with “events that have made a significant contribution to the broad patterns of our history”. In the context of a Native American site where its importance is not recorded in written form, National Register Bulletin 38 (NPS 1998, pp. 12–13) makes it clear that the word “our” refers to the group that finds the property significant and "history" includes both traditional oral and written history. Important events can include specific events, or repetitive trends. Places referred to in Native American oral histories and creation stories, therefore, are potentially eligible.

Native American groups in the Mojave Desert consistently accord originating and continuance importance to springs, petroglyph sites, and particularly trails systems. Trails across the desert mark the locations of travels of ancestral groups as they migrated to the confluence of the Gila and Colorado Rivers. Trails also facilitate dream travel to these places and the times when events mentioned in story and song occurred (Cleland 2005, p. 132). The particular trail that forms the backbone for this cultural landscape, the Halchidhoma Trail (CA-RIV-0053T), is well known from multiple historical and ethnographic sources. It was an essential trade, transportation, and ritual route for Native American peoples and early European visitors in the Colorado Desert during prehistoric and historic times (Ca 1700 – 1825). This route was an essential connection between the Pacific Coast and the Southwestern deserts of Arizona and New Mexico.

Energy Commission staff considers the resources that make up the PTNCL to be significant under NRHP Criterion A (CRHR Criterion 1), for their ties to important events in American history. However, most property types associated with the PTNCL exist today as archaeological resources, such as petroglyphs, pot drops, cleared circles, and webs of intersecting trails. These sites are also considered register-eligible under Criterion D/4 for their ability to yield information important in history and prehistory.

Pacific to Rio Grande Trails Landscape

Theme

The overarching themes of the Pacific to Rio Grande Trails Landscape (PRGTL) are those of origins and destinations, communication, transportation, trade and warfare, in essence the migration, movement, but also stability, by which indigenous cultures were at least partially shaped during the prehistoric past. This theme reflects the building blocks by which a culture or cultures entered into a state of stasis or flux as groups of people responded to fluctuating natural and cultural environments. Humans are unique in their ability to adapt to myriad environments. The catalysts for initiating population migrations are resource utilization and depletion, population growth and subsequent pressures (on one another and the resources), and the corollaries of kinship, technology, commerce, and warfare, thereby changing groups' (and corollary sub-groups') statuses from stasis to flux and vice-versa. Moreover, prehistoric migration patterns often happen on small incremental scales relative to land masses such as continents, which is to say that prehistoric groups seldom migrate noticeably long distances within the lifetime of an individual, but over tens to hundreds of generations migration patterns emerge. With the exception of the Thule (Inuit) migration that covered 2000 miles of artic tundra in approximately 7.5 generations (150 years), most early new world migrations took 115 generations (500 years) to travel several thousand miles (Fiedel 2004:79). At a macro scale, scientific methods reveal long migratory trails across large bodies of land and water, over great spans of time. At a micro scale, trail systems appear as webbed networks that encircle an, or several, environment(s), and bind such areas into a "homeland." Neighboring networks overlap with one another, and in some places longer macro-migration routes course through overlapping micro-homelands. In order to better understand this theme as it relates to the Chuckwalla Valley it is worthwhile to consider how this theme fits within the larger context of human migration and movement in the Western Hemisphere.

Etic Migration Theories

The question of how humans arrived in the Americas has long been debated, and a lack of consensus continues to exist regarding New World migration theories. There are two primary archaeological theories regarding human migration routes to the Western Hemispheres, the Bering Land Bridge Theory and the Coastal Migration Theory (Fagan 2003:47). These theories are not necessarily mutually exclusive, and it is probable that aspects of both theories are applicable to the question of New World population migrations. The Bering Land Bridge and Coastal Migration Theories are based solely on a Western scientific approach to population of the New World. Indeed, many Native Americans today are adamant that these theories do not align with indigenous cultural understandings of their origins. Usually such understandings are encapsulated in oral traditions within religious-cosmological ontologies, i.e. "creation stories". Thus far, research is inconclusive and further study is needed before a definitive answer can be provided (Erlandson et al. 2007:53).

Both the Bering Land Bridge and Coastal Migration theories suggest that humans migrated from northeast Asia at some point during the Late Pleistocene (ca. 15,000 years ago)(Fagan 2003:44); the difference in the theories is primarily in the route taken from northeast Asia and the methods employed by these New World migrants in getting to North America. These are not the only theories that have been proposed as potential models for New World migration (consider the experimental journeys of Thor Hyerdahl), but they are the only theories which accord with the archaeological and paleoclimactic evidence known thus far in the Americas.

The Bering Land Bridge theory postulates that humans made their way by foot across the region between what is now eastern Siberia and western Alaska, also referred to as Beringia. During the Late Pleistocene the climate was much cooler and sea levels were as much as 130 meters lower than they are today (Meltzer 2013:1). As a result of these lower seas, a “land bridge” was exposed connecting northeast Asia with northwest North America, and small bands of nomads crossed the continents as they gathered plant foods and hunted Pleistocene megafauna such as mammoths, short-nosed bears, saber tooth tigers, and dire wolves. As they made their way across the Arctic tundra these people likely lived in Artic refugia, small pockets of habitable land around the glaciers, until they had travelled farther east and south. The southward migration is suggested to have occurred through an ice-free corridor between the Cordilleran (western) and Laurentide (eastern) ice sheets which existed in some form from about 2.6 million years ago until about 14,000 years ago, when the ice sheets began to steadily melt and withdraw (Hidy et al. 2013:1). This corridor was located in western Canada, extending from the southern Yukon down through Alberta and into Montana, following the east side of the Rocky Mountains (Fagan 2003:47). Once through the ice-free corridor, it is understood that these people migrated in all directions populating the Americas in roughly 1,000 years. (See **Cultural Resources Figure 9**)

Tied into the Bering Land Bridge theory is the Clovis-first model. It is believed that these first migrants from Asia manufactured Clovis projectile points after they had migrated into North America. The lithic technology employed prior to Clovis was a form of microblade technology which has been identified in parts of Asia and Siberia (Rondeau et al. 2007:69). Clovis was a widespread stone tool technology characterized by large, fluted projectile points which have been identified in almost all of the states and provinces of North America (Moratto 1984:79). Several of the first finds of Clovis points were found in context with remains of Pleistocene fauna which led some archaeologists to believe that the primary economic activity of Clovis hunters was focused on hunting megafauna, supplemented with gathered seasonal foods (Meltzer 2013:1). Clovis points do not appear in the archaeological record until after the Younger Dryas Event, a climactic oscillation around 12,900 to 11,600 years B.P., and it is possible that this climactic event was the impetus for cultural change among the Clovis peoples. Fluted points do appear in the time period after 11,600 B.P. in the form of Folsom and Llano projectile points, but these are restricted to specific regions and are not as widespread as the Clovis technology (Jones and Kennett 2012:38-39). Clovis points have been found near the project area.

The Bering Land Bridge Theory has been the routine theory of American archaeology over the last 50 to 60 years. However, several researchers have recently questioned this theory through a growing body of literature. Primarily, archaeologists question whether the ice-free corridor was open and habitable during this time period, and postulate that groups may have migrated down the coast exploiting marine resources (e.g., Fladmark 1979:64) in addition to, or in place of the inland migration theory. Other problems identified with the Bering Land Bridge theory include the absence of Clovis-age sites in the ice-free corridor (Erlandson et al. 2007:55), and the presence of non-fluted projectile points which date to the Terminal Pleistocene and are not found in association with Pleistocene fauna, but around pluvial lakes and wetlands (Byrd and Raab 2007:217). Clovis points have been identified in California but most are surface finds and therefore lack any archaeological context (however, see Harrington 1948; Meighan and Haynes 1968 and 1970; Basgall 1988; and Warren and Phagan 1988 for Clovis sites that have been subject to excavation). The sites in California and southern Oregon which have been dated to the same time period as Clovis but which lack fluted points, e.g. Borax Lake in northern California, Paisley Caves in southern Oregon, and sites on the Channel Islands, offer a different interpretation of New World population migration than that purported by the Clovis First model and Bering Land Bridge Theory. That is, a model in which peoples' initial entry into the Americas was via coastal and estuarial areas on the Pacific Coast (the Columbia River, Klamath River, San Francisco Bay, and the Channel Island and Los Angeles basin), from which points they populated the rest of the New World 2000 years prior to the opening of the Cordillerean passage and subsequent migration along that route which provided for additional waves of land migration.

Initially, some archaeologists rejected coastal migration theories due to a lack of evidence of maritime technology; however, recent research has shown that humans were capable of reaching Australia by boat about 50,000 years ago, and between 40,000 and 15,000 years ago had colonized several of the western Pacific island archipelagoes (Erlandson et al. 2007:53). Based on the evidence of early maritime technology, and new evidence from early sites along the Pacific Coast of the Americas, especially from the Channel Islands of Southern California (e.g., Erlandson 2012:25-26), as well as doubts about the feasibility of migration through the ice free corridor, there has been growing acceptance for a Coastal Migration theory. This theory suggests that migrants who were already inclined to maritime practices based on their experiences in the western Pacific (present day Kamchatka, Korea and Japan) made their way south from Beringia via a "kelp highway", a region along the northern Pacific coastlines rich in marine resources with which these peoples were already familiar (Erlandson et al. 2007:55). The projectile point technologies that have been identified at the early coastal sites on the Channel Islands are not related to the Clovis technology, but lithics at some sites exhibit similarities to microblade technology that has also been identified at sites in eastern Siberia (Rondeau et al. 2007:69).

Emic Origin Theories

Emic indigenous understandings of their origins differ significantly from the scientifically derived-based theories of coastal or inland migration. Prehistoric California was a region of incredible cultural diversity; there were at least 78 different languages documented throughout the region (Johnson et al. 2012:49), and recent DNA research affirms that there is a correlation between mitochondrial DNA clades and ethno linguistic groupings (Johnson et al. 2012:68). Understandings of indigenous origins reflect this diversity, and there are many different indigenous cultural understandings of separate origins. However, there are several aspects that tend to be common to most indigenous understandings worldwide, such as 1) a creator who gives life to humans, animals and other spirit beings that are given knowledge of how to live within a landscape and how these knowledge bases are imparted to humans, 2) a geographic center from where all things emanate, radiate and encircle, and 3) oral traditions that recount this story and the role of the specific indigenous group in that story. Moreover, because of the diversity in understandings of indigenous origins there are multiple physical places that serve as the anchor point for a group's culture and knowledge. Often these are geologic or geographic features in which relationships between an indigenous group and their origin understandings are encoded. For example, Mount Shasta, Mount Lassen, Sierra Buttes, Sutter Buttes, Mount Tamalpias, and Mount Diablo are some of the sacred mountains in Northern California. Closer to the project area Charleston Mountain, Newberry (Spirit) Mountain, Palo Verde Peak, Pilot Knob and Mount San Jacinto are also sacred mountain peaks for which tribes attach meaning related to origins. Tribal religions often are a recollection of the sacred bond among the creator, the homeland, life (broadly defined), and the human roles within that network. California religious ceremonies are often sacred journeys about and to originating sources.

Historically, the world of many prehistoric Native Americans was generally restricted to the region in which they were born, and from which their understandings of their origins and cultural knowledge emanate, i.e., their homeland. Groups have had intimate knowledge of their homeland because they spent all of their time travelling within it, obtaining resources and living there. With repeated movement through one's homeland, trails and networks of trails developed for subsistence, source materials for fashioning the technologies of the day, trade to maintain alliances and to secure what could not be procured from one's own lands, but also religious purposes, e.g., pilgrimages, festivals, and with consistent travel over the same areas, groups developed an in-depth knowledge of their landscape that reaffirmed originating knowledges that were provided from a creator, via animals, plants and spirits to humans. Trails were not always walked by indigenous groups, often they ran. Native Americans were notoriously great runners, and they had the ability to run vast distances incredibly fast. Regionally, the Mojave, Chemehuevi, Quechan, Cahuilla, Serrano, Luiseno, Hopi, Navajo and Apache are known to have been excellent runners, and Native Americans continue the tradition today with the "Peace and Dignity Journey" in which Native Americans from both North and South America run from the tips of their respective continents and meet in Mexico (http://sandiego.indymedia.org/pdj/node/1257).

IAll three paradigms probably contribute to the narrative of the peopling of the continent. Among the three primary theoretical constructs that articulate the settlement of any given region in North America, 1) the Bering land Bridge, 2) Coastal Migration and 3) In Situ Creation, staff finds the Coastal Migration paradigm to be a useful and meaningful tool worth further scrutiny in comparison with the In Situ creation paradigm. However, if we are to accept the premise of the Coastal Migration Theory, then California must have played a hugely important role in the dispersal of humans across the rest of North America. California is a region rich in natural resources, both on the coast and in the interior. From the Pacific Coast, one can see that there are three major corridors through which early migrants were able to access the rest of the continent (**Cultural Resources Figure 9**), Environmental and geological constraints limited the potential number of such corridors to1) the Columbia River and Plateau in Washington, the Klamath River and Modoc Plateau in southern Oregon and northern California, and the desert region south of the Sierra Nevada Range in southern California. This is not to say that groups did not venture over and through the vast, towering and intervening mountain ranges, but it was a much more demanding route if they did so, and most likely would have occurred more recently and for local travel rather than fifteen thousand or so years ago. Thus, one coastal option available to migrants who made the multi-generational trip east from southern California was to travel along PRGTL routes when moving east across the Mojave or Colorado Deserts, via the Chuckwalla Valley corridor, a primary focus of this analysis.

There are three major travel corridors in the PRGTL and these continue to be major travel corridors today. Interstate highways now overlay all three. In general, there is a strong, positive correlation between prehistoric Indian trails and modern thoroughfares (e.g., Davis 1961:47-48). The Mojave Desert corridor generally followed the Mojave River, at least at the points where it is above ground, and follows Historic Route 66, what today are the I-40 and I-15 freeways in southeastern California. This route not only connected the Coast with the inland generally but also provided passage between the Central Valley and the Great Basin, including the Owens Valley. The southernmost corridor follows for some distance what has become I-8, although the trail heads northeast towards the Lake Cahuilla (and what is now the Salton Sea) instead of cutting across the desert to go to Yuma, before heading southeast again. This trail connected the Pacific with the inland areas but also provided access between the Baja California peninsula and interior central Mexico. The trail corridor in the Chuckwalla Valley portion of the PRGTL follows the same route as the I-10 corridor between Los Angeles and Phoenix. It is the closest corridor to the PSEGS PAA (Davis 1961: Map 1). After heading in a northeast direction out of the Los Angeles Basin the central of the three Pacific to Rio Grande trails heads east, passing through the Pomona and San Bernardino Valleys before narrowing as it enters the San Gorgonio Pass and into the Coachella Valley. The trail corridor heads east out of the Coachella Valley, paralleling the last few of the Transverse Range Mountains. The trail corridor then enters the Chuckwalla Valley where it branches out in a number of directions. The main trunk, however, continues to the east towards the Colorado River. The Blythe area provided historically one of the few places along the lower Colorado River that could be more easily crossed. From there, the trail continues east towards the Phoenix Basin and

onward to the east, across the Colorado Plateau and down into the northern Rio Grande Valley.

The PRGTL has been used as a migration and movement corridor for at least the last 10,000 years, and probably longer than 15,000 years, although groups using the corridor did not always encounter the same environment over time. The climate in eastern Riverside County and southern California more generally, has shifted dramatically since the Terminal Pleistocene. At this time, pluvial lakes held fresh water, and the moister climate allowed a suite of plants and animals to thrive in a region that would not be able to survive in today's xeric environment. Consequently, humans living within the Chuckwalla Valley portion of the PRGTL as the Pleistocene epoch was coming to a close would have encountered a more inviting environment than that which exists today. Lake Cahuilla (a small portion of which today is coincident with the Salton Sea) could have, at times, dictated the route groups would take. At times the lake spread all the way to the base of the Cottonwood Mountains, forcing groups to take a route through the Orocopia Mountains (Cachora Personal Communication 2013). Such environmental constraints were not rare, and likely was one of the reasons for the "braiding" effect that extant trail segments often exhibit.

The evidence of these ancient trails in the California Deserts, and in particular the Colorado Desert, can still be seen on the surface today. There are several reasons for this, primarily the presence of desert pavement and rock varnish. Desert pavement is the surface of the desert floor and consists of small, inter-locking pebbles and cobbles which have built up over time. Rock varnish is the accumulation of a shiny coating (patina) on rocks from the accumulation of clay minerals and iron and manganese oxides over thousands of years (Gilreath 2007:287). When these eons-old desert pavement and rock varnish are tramped on over time and/or moved out of the way with travelling feet, a visible trail appears on the lighter colored subsurface, which due to the dry climate is frequently not washed away, although sometimes eolian processes bury trails. Tribal people today claim that those originating footprints were the footprints of their ancestors and the traditional knowledge base that is extant today was relayed from those ancestors, despite the interruptions of newcomers such as the Spanish, Mexicans and the Americans that utilized some of same routes in their movements of conquest, appropriation and "discovery."

Chuckwalla Valley Portion of the Pacific to Rio Grande Trails Landscape

Evidence for an early human presence in the Chuckwalla Valley and the surrounding region in the form of fluted projectile points has been identified in the Pinto Basin, in Joshua Tree National Monument to the northwest of the Valley, and also near McCoy Springs, located on the Valley's eastern side. The fluted projectile point site in the Pinto Basin was identified by Elizabeth and William Campbell in the 1930s (Campbell and Campbell 1935), and the McCoy Springs fluted point was identified by a BLM archaeologist in 2012 (Rondeau 2012). These are the only two fluted points that have been identified in Riverside County thus far, although within the larger Mojave and Colorado Desert migration corridor to the north in San Bernardino County at least 29 fluted points have been identified (15 of which are from the China Lake region), and to

the south in Imperial County one fluted point was identified in the Yuha Desert (Dillon 2002:113-114). Not only Clovis points, but directly dated *Olivella* shell beads (originating from the Channel Islands and coastal vicinity) were identified in the PRGTL dating to the same time period as the fluted points, and were also found in the vicinity of the Chuckwalla Valley. These shell beads were derived from the marine purple olive shell in which a small sea snail (*Olivella biplicata)* lives, and were an important trade commodity in prehistoric California (Byrd and Raab 2007:220). An *Olivella* shell bead from a site in the Pinto Basin (CA-RIV-0521) was dated between 11,040 and 8,010 years B.P. (Fitzgerald et al. 2005:Table 2).

Long-distance trade networks extended beyond interior California; *Olivella* shell beads from southern California were identified in portions of the northern and western Great Basin (Howard and Raab 1993) and parts of the southern Great Basin, some of which were dated to as early as 10,300 to 10,000 years B.P. (Fitzgerald et al. 2005:Table 2). Shell beads identified from the northern and western Great Basin were dated to the Middle Holocene (5,460 to 4,365 years B.P.) (Vellanoweth 2001:Table 1), indicating that this interaction sphere extended at least through this period. Evidence for exchange between the Pacific Coast and the Great Basin has also been identified in the form of stone spheres discovered in both the Great Basin and the coast (Sutton and Koerper 2005:1), as well as obsidian sourced from the northwestern Great Basin, found in Orange County (Macko et al. 2005:97-98), and additional coastal sites with obsidian sourced from points all over California (Jackson and Ericson 1994:394). The closest obsidian source to the PSEGS project area is Obsidian Butte near the edge of the current day Salton Seashore. When the water level was low enough to access Obsidian Butte, people obtained this obsidian and traded it between groups, but likely to a somewhat lesser degree than other obsidian sources (Jackson and Ericson 1994:398).

Interaction spheres in Western North America were not limited to the Pacific Coast and the Great Basin, but variously included the Gulf of California, Puebloan groups in the Southwest, and the Colorado River area (Jackson and Ericson 1994:398), and even played a role in the massive trade network of which Chaco Canyon in New Mexico was a major hub ca. 1,100 years ago (Mathien 1993:36). The Chuckwalla Valley played an important role in this trade, because it was a relatively direct route to the Colorado River and then into Arizona. Traded items through this corridor included “shells and ornaments from the south coast area and the Gulf of California, obsidian from the Great Basin and Mojave Desert, Puebloan ceramics, and ceramics made in the southeastern subregion itself” (Jackson and Ericson 1994:398). It should be noted that the traded items noted above are only those that preserve well in the archaeological record, and ethnohistorically documented trade relationships indicate that perishable goods were also exchanged. These included such items as various vegetal foods and seeds, paint, baskets and basketry related items, tobacco, yucca fiber, sandals, feathers from eagles and other birds, salt, dried fish, sea otter pelts, deer skins, cotton, finished textiles, horses, rabbit-skin blankets, meat from deer, mountain sheep, antelope, cottontail rabbit, and rats, Hopi and Navajo blankets, and wool ponchos (Davis 1961:15-45). It is reasonable to assume that these items were traded ca. 10,000 years ago (or earlier) just as shell beads and obsidian were, but did not preserve in the archaeological record.

Despite the fact that the basic artifact types and raw materials that were exchanged over many thousands of years did not change drastically, the cultural contexts in which these goods were exchanged did change relatively frequently due to the frequent ethnic population movements and relocations in California (Jackson and Ericson 1994:387). Unfortunately, this aspect is not as discernible in the archaeological record as raw materials and artifacts. It is also important to note that over time the distance that exchange networks in California covered decreased. That is, during the Paleoindian through the Middle Archaic periods objects, usually finished artifacts, were traded over fairly long distances. By the Upper Archaic the variety of objects traded was higher, but the distance the objects travelled was not as extensive (Jackson and Ericson 1994:387). Trade was not always unidirectional between groups, and the cultural meaning assigned to objects very likely was not the same between trading groups, especially between non-local groups (Jackson and Ericson 1994:388). While not found as readily in the archaeological record, communication of distant events also circulated across the trail networks. For example Yurok people on the lower Klamath River had heard of Christopher Columbus and his three boats before the Spanish had set anchor in Trinidad Bay in 1775. In depth studies of trail side petroglyphs may provide some insight into distant historic events and the role of the trail and trade networks had in long distance communications.

It is important to understand that the region in which the Chuckwalla Valley sits has likely been a central migration and movement corridor since not long after initial settlement in the New World. Not only does the archaeological evidence above allow such an interpretation, but ethnographic evidence confirms this as well. Indigenous understandings of their origins are tied directly to the immediate landscape and homeland in which they live. Movement corridors associated with oral traditions in the vicinity of the Chuckwalla Valley include the Xam Kwatcam Trail along the Colorado River, a trail associated with the Yuman speakers' oral traditions, and the Salt Song of the Chemehuevi Tribe. Moreover, there are multiple elements in the Chuckwalla Valley and in the larger Chuckwalla Valley region which contribute to the character and definition of such a trail corridor.

The most recognizable element of a movement corridor is a trail, or in the case of the Chuckwalla Valley, a system of trails (**Cultural Resources Figure 10**). By examining the ethnographic and ethnohistoric maps and literature, historic plat maps, and archaeological site records, we can see a vast network of trails in the Chuckwalla Valley, several of which pass directly through the PSEGS project area footprint. More importantly, these maps show that there were multiple routes into and out of the valley, but also trails that connected places of importance within the Chuckwalla Valley, such as habitation sites, springs, resource procurement locales, and rock art sites.

The migration and movement corridors of the southern California Desert were not restricted to trading and the migration of peoples, these activities also often had a religious and/or cultural component to them. For example, when groups traded they were not only trading physical goods, but language and ideas as well. Trails were also important for warfare, especially in the Colorado River Valley which was the region that experienced the most intense warfare in all of California (Allen 2012:381). For example,

what is documented as a single linear path, more often in desert environs are several parallel trails (Johnston and Johnston 1957: 23) which may be explained by attributing each linear trail to a specific ethnic group (Apple 2005:107; Laird 1976:136; Laylander and Schaefer 2011:64). These were thoroughfares for intercultural travel as contrasted with intra-cultural travel, similar to how modern freeways often are paralleled by frontage roads for local traffic. This is especially true in the Chuckwalla Valley where the boundaries between tribes often overlap; it is a region on the periphery of several groups' ancestral territories. These separate trails allowed antagonistic groups to avoid each other while travelling through inter-cultural trail corridors (Laird 1976:136).

Some trails are affiliated with various songs and/or stories sung or told by Native American groups. These are not necessarily physical trails in the sense of an archaeological feature, but, in the minds of the groups that ascribe cultural importance to such trails, they are just as real. In a similar esoteric vein, the role of dreaming and the trails upon which dreamers travel are especially important resources to Native Americans. Dreaming, the knowledge and methods for proper dreaming, and the revelations resulting from dreaming are thought to be the basis of Lower Colorado Native American lifeways (Forde 1931:201-204; Gifford 1926:58-69; Kroeber 1976:754-755, 783-784; Wallace 1947:252-258)

There is physical and epistemological[30] overlap of trails on and through the landscape regardless of the intent and psychological disposition of the traveler. That is to say, that a trail, a traveler, and the knowledge of the trail (usually encapsulated in a song or dream) are not separate and distinct realities. Or, that one method of travel (i.e., walking or running) is more real or supersedes another method of travel (singing or dreaming) (Lincoln 2003:189-206; Johnson 2003). This is difficult to articulate in English, and is a methodological constraint that staff has taken into consideration.

There are few, if any, locations within the Chuckwalla Valley where groups stayed for extended periods of time, i.e., permanent year-round occupations. Groups only had to travel about 50 miles to the east or west to reach the Colorado River or the Coachella Valley/Salton Sea, locations with ample water and food resources. Therefore, when groups were living in the Chuckwalla Valley their location was primarily determined by access to water and food resources. For example, temporary camps and seasonal residences in the valley appear to have clustered around Palen and Ford Dry Lakes, or the few springs in the area. Other temporary camps in the valley are located in close proximity to important resource locations. There are several known significant resource locations within the Chuckwalla Valley, the NRHP-listed North Chuckwalla Mountains Quarry District (CA-RIV-01814), Alligator Rock on the north side of the Chuckwalla Mountains was another source of lithic materials, and dense mesquite dunes at least at the base of the Coxcomb Mountains at the mouth of Pinto Basin Wash, and located adjacent to and within portions of the Palen Dry Lake ACEC. There are likely many unknown regions in the Chuckwalla Valley that were also important resource locations, but there is a dearth of data, especially in the southern Coxcomb, eastern Palen

[30]Epistemology: the branch of philosophy that studies the origin, nature, methods, validity, and limits of human knowledge.

Mountains, portions of the western McCoy Mountains, the northern extent of the Little Chuckwalla Mountains and the Chuckwalla Mountains and the eastern edges of Eagle Mountain. Moreover, these areas, habitation sites, springs, and plant, animal and lithic resource locations, are all connected with tributary trails. Lifeways in the Valley were tethered to the trail network, because Valley resources were essential to both those who travelled the PRGTL and to those who lived along it, and therefore more likely controlled and regulated trade, traded themselves and provisioned travelers.

Rock art is a fundamental component of the trail network that courses through the Chuckwalla Valley. Rock art is "the designs, motifs, or patterns that are permanently placed on a feature on the natural landscape" (Whitley 2000:35). Rock art, and the creators and viewers of the art, can be thought of as involved in a type of communicative engagement embedded in a broader landscape. That is to say that the "conversation" of the rock art can occur between multiple different parties, and for multiple different reasons but within one or several landscapes over variable times and spaces. For example, rock art may communicate territorial claims, it may reflect a spiritual conversation between a teacher and a student about a place, between a person and their ancestors, or between a person and the immediate natural world or a supernatural world, or it may communicate various signs which direct or inform the viewer about a place or specific guidance or directionality of one place to another. Rock art meaning is no longer readily available, because the communicators are no longer present for us to query as to communicative intent; we are therefore left to decipher meaning. Interpretation should rely on icon depiction, but be informed by the relationships between various depictions and relationships of various rock art locales to other known natural and cultural locales, as well as ethnographic, ethnohistoric, and current oral history evidence and analogy.

There are at least 56 recorded rock art sites located within the Chuckwalla Valley. These sites rarely occur in isolation, and are often associated with other features of ethnographic and archaeological relevance. There is a positive correlation between habitation deposits, e.g., lithic materials, camps, groundstone/milling features and rock art sites, which some researchers interpret to mean that if these rock art sites "were created during religious or ceremonial activities, these activities were not spatially removed from subsistence activities and residence, and instead were publicly visible social rituals occurring within residential locations" (Shock 2007:70). More importantly for the Chuckwalla Valley, there is an even stronger positive correlation between rock art sites and trails. Most of the rock art sites within the Landscape (77%) are directly affiliated with a trail segment, highlighting the importance of rock art sites to the trail network. Rock art sites also have a positive correlation with springs and tank locations in the valley, and again, trails connect these sources of water and therefore connect all of these important places.

There are three types of generally accepted migration/origin theories, the Bering Land Bridge, Coastal Migration, and In Situ Creation. The Chuckwalla Valley portion of the PRGTL is unique in its ability to convey a link between these theories. There were three geographically limited corridors through which west/east movement likely occurred. One of these corridors is the southern California desert area, the PRGTL, of which there were three regional corridors for west/east movement. The Chuckwalla Valley portion of the PRGTL is significant for three main reasons. One is that this area is the first place (from west to east) where travelers reached a junction of trails, providing an opportunity to head north, continue east or head south; the Chuckwalla Valley was basically a trail junction center for the middle corridor of the PRGTL. This region is also important because of several overlapping tribal claims to the area over time; claims to an area or places within the area, claims to occupation, claims to resource extractions and claims to the right to thoroughfare. There is some ethnographic, ethnohistoric, and archaeological evidence that several different cultural groups indeed considered the Chuckwalla Valley as their own, and thorough petroglyph research in the Valley may bear this out. That is, petroglyphs are often territorial identifiers, and the superimposition of petroglyphs can be indicative of territorial claims and related conversations among groups over both time and space concerning the uses, locations and meanings of the area. Moreover, if robust cultural resources research were to occur in the region, the results would bear out such nuanced conversations. The Chuckwalla Valley portion of the PRGTL is an important area, contributing to a larger regional landscape that has potential to yeild understandings about human flux and stasis in the Southwest and the larger as-of-yet unanswered question of the settling of North America. The larger landscape approach also provides opportunity to yield a powerful planning tool for utility-scale renewable energy projects siting in the southern desert region, and has major implications for archaeological, ethnographic, and tribal values.

Cultural Resources Table 17
Chuckwalla Valley Portion of the Pacific to Rio Grande Trails Landscape Chronology[31]

Time	Specific Places, People, and Events
Beginning of Time	Mojave – Sky (male) and Earth (female) give birth to Matavilya, his daughter, Frog, his son or brother Mastamho, and all men and beings. Mastamho takes the men and beings with him to live at Avikwame. Quechan – Kwikumat and Blind Old Man emerge from the water, and Kwikumat creates man and then Kumastamxo, who takes the people to live at Avikwame. Cahuilla – Mukat and Tamaioit are born from Mother Darkness, and then create a cricket, *Papavont* (another insect), a black and white lizard and a person, Whatwhatwet, to drive away the darkness.

[31] The bold line in the table separates the indigenous understandings and the archaeological understandings of the cultural chronology in the region. There are significant differences between Native American understandings and the scientific-based archaeological perspective, primarily in the designation of absolute dates that archaeology assigns to specific time periods. That is not to say that these two perspectives are irreconcilable, but currently there is not enough information to understand how the two understandings fit together.

Time	Specific Places, People, and Events
	Chemehuevi – The area is flooded. Primordial animals abide on Mount Charleston to wait out the residing water. Coyote releases first humans from a basket.
Time of Instruction	Mojave – Mastamho teaches the Mojave to farm, cook with pottery, to speak and count, and to stay in the country Quechan – Kwikumat places the different Yuman groups in their respective territories and gives the men speech Cahuilla – Mukat and Tamaioit each create different groups of people, these two quarrel about who's people are better and Tamaiot sings a song sinking into the earth, taking his people with him Chemehuevi – Wolf used his great power to create the Chemehuevi and their kindred, and Coyote conceived of the relationship between men and women who followed Coyote's teachings
Period of Yuman, Cahuilla, and Chemehuevi occupation	The various Yuman groups leave Avikwame and travel along the Colorado River to their respective homelands as assigned by the Creator, as part of permanent or seasonal encampments The Cahuilla settle around the springs in the Coachella Valley as part of permanent or seasonal encampments The Chemehuevi settle in the desert region west of the Colorado River as part of permanent or seasonal encampments
Paleo-Indian Period (ca. 10000-8000 B.C.)	Sites from this period are identified by fluted projectile points, and were deposited during the Late Pleistocene-first half of the Early Holocene
Lake Mojave Complex (8000-6000 B.C.)	Also known as the Western Pluvial Lakes Tradition, this complex is identified by Great Basin Stemmed Series projectile points, bifaces, steep-edged unifaces, crescents, and occasional cobbles and stone tools
Deadman Lake Complex (7500-5200 B.C.)	Currently confined to the Twentynine Palms area, this complex is characterized by surface sites on old alluvial pediments, with artifacts including small-to-medium size contracting stemmed or lozenge-shaped points, battered cobbles and core tools, bifaces, simple flake tools, and ground stone tools
Pinto Complex (8000-3000 B.C.)	This complex is characterized by stemmed and indented, highly reworked, Pinto series projectile points. Ground stone tools and bifacial and unifacial tools are common. Large residential camps, occupied for prolonged periods, with logistical forays into surrounding patches
Possible Abandonment (3000-1000 B.C.)	Environmental conditions were warmer and drier during this time Altithermal period, and few archaeological sites date to this period
Gypsum Complex (1000 B.C.-A.D. 200)	Corner-notched Elko Series points, concave base Humbolt Series points, and well-shouldered contracting stemmed Gypsum Series points characterize this complex, as do bifaces ,manos and metates, increased trade and social complexity, quartz crystals, paint, split-twig animal figurines, and rock art

Time	Specific Places, People, and Events
Rose Spring Complex (A.D. 200-1000)	There was a major population increase at this time, and the bow and arrow was a known technology and Rosegate Series points were used. Intensive occupation is indicated by wickiups, pit houses, and other structures, and obsidian appears to have significantly structured settlement-subsistence
Late Prehistoric Period (1000-1700)	Horticulture and pottery are introduced, and a complex cultural landscape composed of rock art, trails, and geoglyphs developed
1540	Hernado de Alarcon journeys up the Colorado River to about the Yuma area
1702	Father Eusebio Francisco Kino explores portions of the Colorado Desert in his attempt to find an overland route between Sonora and the Pacific Coast
1772-1774	Fray Francisco Garces explores portions of the Colorado Desert in an attempt to find an overland route to the Pacific Coast, eventually is successful and makes it to Mission San Gabriel with an expedition headed by Captain Juan Bautista de Anza
1779	Two mission outposts are established near Yuma
1781	The Quechan fight the missionaries, settlers, and soldiers at Yuma missions and prevent any more overland passage via the Yuma Route to the Pacific Coast
1823-1826	Jose Maria Romero heard of a Native American route from Mission San Gabriel to the Colorado River by way of the Blythe area and makes several expeditions to find it. On January 6, 1824 the expedition is in the vicinity of the project area and noted the San Pascual well
1848	The Treaty of Guadalupe Hidalgo is negotiated between the United States and Mexico. Mexico ceded a large portion of what is now California, Nevada, Arizona and New Mexico to the United States. The united States, among other things, extends the same rights to the occupying Native Americans that the Mexican government had extended.
1849	The Gold Rush starts in California and an estimated 100,000 miners make their way west via the Yuma Route
1851	The United States negotiates with numerous tribal leaders throughout the State of California resulting in 18 treaties, some of which pertain to tribes in Southern California. However these treaties are never ratified by Congress.
1855-1857	General Land Office surveys of the region, Frink's Route and Brown's Road is opened
1861	Gold is discovered by Paulino Weaver in the Mule Mountains
1862	The Bradshaw Trail, and ferry at the Colorado River, is opened to serve the mining interests in La Paz
1865	Gold and iron mining begins in the Eagle Mountains
1867-1895	Various tribal reservations are established throughout Southern California and along the lower Colorado River. Native Americans are removed from their traditional home places relocated to the reservations
1877	The Desert Land Act of 1877 is enacted, allowing individuals to claim land that was not possible to farm without artificial irrigation
1877	Mining in the Chuckwalla Mountains begins
Early 1880s	Thomas Blythe pays for the Palo Verde canal's construction

Time	Specific Places, People, and Events
1880	Matthew Palen and H. Connor begin copper mining in the Palen Mountains
1883	Blythe dies and further irrigation work is halted
1887-1934	Allotment Act is passed that effectively removes much of reservation lands from Indians into non-indian ownership as an attempt to make Indian people contributors to the larger society. Indian children are forcibly removed from their families and sent to boarding schools in order to further disrupt cultural continuity.
1902	Mining begins in the McCoy Mountains
1904	The Palo Verde Land and Water Company purchase the Blythe Estate and constructs additional irrigation works
1905	The Colorado River floods the Alamo Canal and the Salton Sea is filled
1909	Most of the land in the valley is taken up by purchase, desert claim, or homestead
1911	Mining in the Coxcomb Mountains begins
ca. 1911	Peter S. Gruendike expands Brown's well, builds 10-foot windmill and plants over 300 trees, about two miles northwest of the PSEGS project area
1913	The Chuckwalla Valley and Palo Verde Irrigation Association is formed by 410 desert entry-men
1915	Stephen "Desert Steve" Ragsdale acquired Gruendike's property and operated a towing business
1917	Palo Verde Joint Levee District is established
1917	Electricity comes to Blythe in the form of diesel-powered generators
1921	The Palo Verde Drainage District is established
1921	US Route 60 is opened and Ragsdale establishes the town of Desert Center, with a café, service station, market, post office, and cabins along the dirt state/federal highway
1923	California state legislature passes Palo Verde Irrigation Act
1930	A transmission line is constructed between Blythe and the Imperial Valley providing reliable electricity
1933-1941	The Colorado River Aqueduct is constructed between Lake Havasu and the east side of the Santa Ana Mountains
1934	The Indian Reorganization Act is passed to reverse the previous US policy of tribal culture and tribal government disruption.
1936	US Highway 60-70 between Indio and Blythe is paved

Period of Significance

The period of significance for the Chuckwalla Valley portion of the PRGTL spans from time immemorial to at least from the initial peopling of the Pacific Coast and by Beringian migrants ca. 14,000 years ago to 1936 with the establishment of U.S. Highway 60-70 as a paved highway and prior to the use of a landscape as the Desert Training Center. During the 1930s the entire landscape was transformed. The Great Depression significantly affected the desire of whites to purchase Indian lands, and Roosevelt appointed John Collier as Commissioner of Indian Affairs. The Indian Reorganization Act, passed in 1934, allowed for Indian tribes and individuals to acquire more land, encouraged tribes to adopt a constitution and assert their sovereign (Pevar

1992:6). By the end of the decade war was on the horizon for the country, and General Patton and his troops came into the region soon after.

Beginning Date

"From time immemorial" can mean either, "from the time of the creation" or can mean "before anyone alive today can remember or conjecture." Given that the migration to, and peopling of North America is open to debate in the archaeological community and that creation stories exist in the vicinity of the Chuckwalla Valley, an indeterminate beginning date is warranted.

Ending Date

Staff notes that Indian trails become Spanish mule train trails, that become American wagon trails, that become the early rutted road systems, that later become paved and driven on by people today, including Native Americans. With the paving of the road the automobile greatly increased access to and through the Chuckwalla Valley and allowed for a great influx of activity into the Chuckwalla Valley, and particularly the activities conducted by millions of World War II military personnel preparing for desert battle on the desert training center grounds. The period of significance spans several eras of Native American relations with others, and those relations play out along the trails and later roads. The Indian Reorganization Act was passed in 1934 and ushered in a positive change in federal Indian policy towards tribes and the upholding and revitalization of indigenous cultures that had not been realized since the promises of the Americans towards Native Americans were inked in the Treaty of Guadalupe Hidalgo (1848).

Boundary

Pacific to Rio Grande Trails Landscape (PRGTL) Boundary

THE PRGTL IS NOT BEING PROPOSED FOR ELGIBILITY OR NOMINATION TO ANY STATE OR NATIONAL REGISTER. IT IS DESCRIBED IN THIS DOCUMENT BECAUSE IT PROVIDES THE BROADEST THEMATIC CONTEXT WITHIN WHICH DESERT SOLAR RENEWABLE PROJECTS ARE CURRENTLY BEING PROPOSED, INCLUDING THE PALEN SOLAR ENERGY GENERATING SYSTEM.

The boundary of the PRGTL, a cultural landscape that reflects a major trail corridor that connects the Southern California Pacific Coastline to the northern Rio Grande Valley and includes three prominent trail corridors: the Northern (I-40/I-15) corridor, the Central (I-10) corridor and the Southern (I-8) corridor. The landscape is bounded on the North (and listed from west to east) by the Santa Barbara Mountains, the Garlock faultline, the Spring Mountains, the Colorado Plateau and the Northern Rio Grande Valley (Santa Fe, New Mexico). The landscape is bounded on its southern extent by the northern terminus of the Sea of Cortez and the Gila River watershed in its entirety. This broad landscape is uniquely positioned and bounded because it provides the area that most likely and most readily provides the greatest potential for understanding coastal-interior migrations between the two most viable routes for entry, population and settlement of

North America and within which viable indigenous cultures exist that maintain intimate and intact knowledge of origins, migrations and homeland ecological knowledge. This broad landscape is treated as a thematic context within which the Chuckwalla Valley portion of the cultural landscape is articulated.

Chuckwalla Valley portion of the PRGTL

The Chuckwalla Valley portion of the PRGTL consists of the Chuckwalla Valley/Palen Valley and the surrounding mountains: Eagle Mountains, Coxcomb Mountains, Palen Mountains, the Southern McCoy Mountains, the Little Chuckwalla Mountains, and the Chuckwalla Mountains; ostensibly, the mountain ridgelines within traveler's view as the trail corridor was traversed across and through Chuckwalla Valley. However because the project amendment direct visual effects ensue from the towers for approximately a 15 mile radius, staff is only analyzing the Chuckwalla portion of the PRGTL that is in view of the towers within the approximate 15 mile radius (see **Cultural Resources Figure 1**). For purposes of analysis this portion is considered a cultural landscape that is "nested within" or contributes to the larger PRGTL.

Technical Classification of the Landscape and Applicable Guidance

The Chuckwalla Valley portion of the PRGTL has been identified by staff as a cultural landscape and historical resource under CEQA that has both archaeological and ethrographic contributing elements. The landscape appears to date from a presently undetermined point in prehistory through 1936 and includes archaeological sites and features, Traditional Cultural Properties, a complex trail system, springs, tanks, and wells, and culturally important plant and animal species. Applying NPS guidance developed for the NRHP to the consideration of the landscape as a cultural resource under the parallel CRHR (NPS 1994, 1999, 2000), the combination of cultural and natural features that make up this composite resource qualify the resource as a type of cultural landscape.

Landscape Contributing Elements and Characteristics

Staff's knowledge of the character of the PSEGS Chuckwalla Valley portion of the PRGTL and the elements with which it is composed is constrained because there has been relatively little systematic survey of the landscape. The records search for the present analysis reveals that the majority of the cultural resource investigations have taken place along the I-10 corridor and the northern portion of the Chuckwalla Mountains. The information that is presently available about the landscape is a product of these previous studies, in addition to staff's informal reconnaissance of portions of the landscape in the Coxcomb and Palen Mountains in July of 2013.

The Chuckwalla Valley portion of the PRGTL is composed of both natural and cultural elements. The natural elements include lithic quarries, mesquite dunes, mud flats and dry lakes, springs, tanks, wells, washes, culturally important plants and animals, and desert pavement. Most of these elements had the potential to provide resources to prehistoric Native Americans, and very often, there is archaeological evidence of cultural activity at these natural resource locations. That being said, the frequency and character of the archaeological deposits that constitute the cultural elements of the

proposed landscape are unclear. Representative archaeological data for the landscape are presently unavailable. However, what is presently known is that relatively robust archaeological deposits are usually associated with important natural features such as those listed above.

The proposed Chuckwalla Valley portion of the PRGTL is ultimately the result of the dynamic interaction between the natural elements of the landscape and the movement of the different Native American cultures that lived and passed through the region. The tangible, extant evidence of this interplay are the landscape characteristics that are a part of its formal definition. Of the 11 landscape characteristics set out in National Register Bulletin 30 (NPS 1999:3-6), the proposed landscape has the potential to possess all of them: land uses and activities, patterns of spatial organization, response to the natural environment, cultural traditions, circulation networks, boundary demarcations, vegetation related to land use, buildings, structures and objects, clusters, archaeological sites, and small-scale elements. These characteristics reflect and articulate the reciprocal manner in which the land has shaped Native American cultures and, in turn, the manner in which successive and overlapping Native American cultures shaped the land through time.

Cultural Resources Table 18
Inventory of Contributing Elements for the Chuckwalla Valley Portion of the Pacific to Rio Grande Trails Landscape

Element Name	Location Relative to Facility Site	Character of Element
Palen Mountains Resource Area	Northeast, East	Archaeological deposits, potential natural resources,
Palen Dry Lake ACEC	North	Archaeological deposits, potential natural resources,
Coxcomb Mountains Resource Area	North	Archaeological deposits, potential natural resources,
Coxcomb Fringe Mesquite Area	North	Archaeological deposits, potential natural resources,
Eagle Mountains Resource Area	West	Archaeological deposits, petroglyphs, potential natural resources,
Raceway Mesquite Area	Northwest	Archaeological deposits, potential natural resources,
Chuckwalla Mountains Resource Area	Southwest, South, Southeast	Archaeological deposits, petroglyphs, potential natural resources,
McCoy Mountains Resource Area	East	Archaeological deposits, potential natural resources,
Inter-resource Area Archaeological Deposits	None presently known	Archaeological deposits,
Palen Dunes/Palen Lake TCP	North	Archaeological deposits, trails, potential natural resources, possible cremations

Element Name	Location Relative to Facility Site	Character of Element
Ford Dry Lake TCP	East	Archaeological deposits, trails, possible cremations, potential natural resources
McCoy Spring TCP	Northeast	Archaeological deposits, petroglyphs, trails, cleared circles, rock rings, water, potential natural resources
Chuckwalla Spring TCP	South	Archaeological deposits, trails, potential petroglyphs, cleared circles, water, potential natural resources
Corn Spring TCP	Southwest	Archaeological deposits, trails, petroglyphs, cleared circles, rock rings, water, potential natural resources
North Chuckwalla Mountains Petroglyph District TCP	West	Archaeological deposits, petroglyphs, cleared circles, rock rings, trails
North Chuckwalla Mountains Prehistoric Quarry District TCP	West	Archaeological deposits, potential natural resources
Long Tank TCP	West	Trails, water, potential natural resources
Alligator Rock TCP	West	Archaeological deposits, rock rings, trails, potential natural resources
Dragon Wash TCP	West	Archaeological deposits, trails, petroglyphs, potential natural resources
San Pascual Well TCP	North	Trails, water, potential natural resources

Cultural Resources Figure 11 visually depicts the inventory of contributing elements to the Chuckwalla portion of the PRGTL.

Evaluation of the Chuckwalla Valley portion of the PRGTL Cultural Landscape

Criteria for Evaluation

This Landscape is eligible under Criterion 1 at the regional level for its broad contributions to the unique historic events that shaped Native American understanding of the landscape and movement through the landscape, and their ongoing traditions and history that have allowed them to survive, and at particular periods of their existence, flourish, in a place that many non-Native Americans would consider harsh, inhospitable, or vastly in need of improvement.

This Landscape is also eligible under Criterion 3 at the regional level for its contributions to the collection of petroglyphs in the region, without which the high artistic value of these sites would be lost. Petroglyphs were created for unknown purposes by unnamed artists, yet continue to convey a host of sentiments to both Native Americans and non-Native Americans, albeit very different sentiments. Moreover, petroglyphs retain a high degree of artistic value because of their place within a larger, natural setting which influences the manner in which one understands the art.

The Landscape is also eligible under Criterion 4 at both the local and regional level of significance for the potential to yield archaeological and ethnographic information important to the prehistory and history of the Chuckwalla Valley, and the PRGTL more generally.

Integrity

The Chuckwalla Valley portion of the PRGTL maintains the aspects of integrity of setting, integrity of feeling, and integrity of association. This discussion of integrity will address how the integrity of setting, feeling, and association are preserved within the specific criteria for which the landscape is eligible.

Criteria 1 – Integrity of setting is applicable to this criterion because the physical character of the area in which the unique historic events that shaped Native American understanding of the landscape and movement through the landscape is still relatively pristine. The setting in which the landscape sits has not been dramatically altered with respect to the geological features (e.g., Chuckwalla, Palen, Coxcomb, and Eagle mountain ranges, Alligator Rock) or the vegetation in the area, and the relationship between the contributing elements of the Chuckwalla Valley portion of the PRGTL continue to be clear. Thus, if a prehistoric traveler along the Chuckwalla Valley portion of the PRGTL were able to view the setting as it exists today, the traveler would still recognize the landscape as place where the unique historic events occurred. There are several modern man-made constructions within the landscape that do impact the integrity of setting in ways which have affected the geologic features, vegetation, and relationship of the contributing elements (e.g., the 1-10 freeway and transmission lines that parallel the road, State Route 177, the town of Desert Center, mining in the surrounding mountain ranges, refuse from historic and modern vehicle traffic, refuse, tank tracks and other military features associated with the DTC, and new energy facilities such as GSEP, Desert Sunlight, and the Red Bluff Substation); however, these impacts to the integrity of setting are nominal to the overall sense of setting the unique historic events that occurred within the landscape convey. If the PSEGS solar power towers were constructed, the landscape would no longer retain the integrity of setting to convey these unique historic events.

Integrity of feeling is applicable to this criterion because the physical features taken together that are associated with and help to convey the unique historic events that shaped Native American understanding of the landscape and movement through the landscape are still relatively pristine. These physical features include biological, geological, and hydrological elements such as plants and animals, mountains and valleys, and washes, springs, and tanks, and these intact physical features continue to

convey the period of significance for the landscape. There are some modern intrusions that impact the feeling of the landscape (e.g., the 1-10 freeway and transmission lines that parallel the road, State Route 177, the town of Desert Center, mining in the surrounding mountain ranges, refuse from historic and modern vehicle traffic, refuse, tank tracks and other military features associated with the DTC, and new energy facilities such as GSEP, Desert Sunlight, and the Red Bluff Substation); however, these impacts to the integrity of feeling are nominal to the overall feeling of the period of significance that the unique historic events that occurred within the landscape convey. If the PSEGS solar power towers were constructed, the landscape would no longer retain the integrity of feeling to convey these unique historic events.

Integrity of association is applicable to this criterion because the landscape as defined, is the place where the unique historic events that shaped Native American understanding of the landscape and movement through the landscape occurred, and the physical features of the landscape continue to convey the direct link between these events and the historic resource. These physical features consist of biological, geological, and hydrological elements, as well as archaeological sites and features, and ethnographic places. There are some intrusions that impact the integrity of association within the landscape (e.g., the 1-10 freeway and transmission lines that parallel the road, State Route 177, the town of Desert Center, mining in the surrounding mountain ranges, refuse from historic and modern vehicle traffic, refuse, tank tracks and other military features associated with the DTC, and new energy facilities such as GSEP, Desert Sunlight, and the Red Bluff Substation); however, these impacts to the integrity of association are nominal to the resource conveying the link between the landscape and the unique historic events associated with this portion of the landscape. If the PSEGS solar power towers were constructed, the landscape would no longer retain the integrity of association to convey these unique historic events.

Criteria 3 – Integrity of setting is applicable to this criterion because the physical character of the petroglyph sites in the area is still relatively pristine. The setting, i.e., the geological features and vegetation, in which these petroglyph sites are located has not been dramatically altered, nor has vandalism and looting destroyed these sites to the point at which their high artistic value is lost, and the relationship between these areas and other contributing elements to the Chuckwalla Valley portion of the PRGTL continues to be clear. The physical features constituting the setting for these resources with high artistic value include the rock on which the petroglyphs are made, the petroglyphs themselves, and the associated natural features such as springs or washes at these sites. There are several intrusions that impact the integrity of setting in ways which affect the geological features, vegetation, and the relationship of the contributing elements of the landscape (e.g., vandalism and looting, the 1-10 freeway and transmission lines that parallel the road, State Route 177, the town of Desert Center, mining in the surrounding mountain ranges, refuse from historic and modern vehicle traffic, refuse, tank tracks and other military features associated with the DTC, and new energy facilities such as GSEP, Desert Sunlight, and the Red Bluff Substation); however, these impacts to the integrity of setting are nominal to the overall sense of setting the high artistic values at the petroglyph sites in the landscape convey. If the

PSEGS solar power towers were constructed, the landscape would no longer retain the integrity of setting to convey these high artistic values.

Integrity of feeling is applicable to this criterion because the physical features taken together that are associated with the high artistic values of the petroglyph sites remain relatively pristine. These physical features include biological, geological, and hydrological elements such as plants and animals, rock faces and boulder outcrops, and washes, springs, and tanks, and these intact physical features continue to convey the period of significance for the petroglyph sites, and in turn the larger landscape. There are some modern intrusions that impact the feeling of these areas (e.g., vandalism and graffiti, the 1-10 freeway and transmission lines that parallel the road, State Route 177, the town of Desert Center, mining in the surrounding mountain ranges, refuse from historic and modern vehicle traffic, refuse, tank tracks and other military features associated with the DTC, and new energy facilities such as GSEP, Desert Sunlight, and the Red Bluff Substation); however, these impacts to the feeling of the landscape are nominal to the overall feeling of the period of significance that these petroglyphs convey. If the PSEGS solar power towers were constructed, the landscape would no longer retain the integrity of feeling to convey these high artistic values.

Integrity of association is applicable to this criterion because the locations where one finds petroglyphs within the landscape are the same, exact places where this high artistic endeavor was carried out during prehistory, and the physical features of the landscape continue to convey the direct link between these events and the historic resource. These physical features consist of biological, geological, and hydrological elements, as well as archaeological sites and features, and ethnographic places. There are some intrusions that impact the integrity of association within the landscape (e.g., vandalism and looting, the 1-10 freeway and transmission lines that parallel the road, State Route 177, the town of Desert Center, mining in the surrounding mountain ranges, refuse from historic and modern vehicle traffic, refuse, tank tracks and other military features associated with the DTC, and new energy facilities such as GSEP, Desert Sunlight, and the Red Bluff Substation); however, these impacts to the integrity of association are nominal to the resource conveying the link between the landscape and the unique historic events associated with this portion of the landscape. If the PSEGS solar power towers were constructed, the landscape would no longer retain the integrity of association to convey these high artistic values.

Criteria 4 – The aspects of integrity, setting, feeling, and association are not applicable to this criterion. That is, the ability of the landscape to potentially provide information important to local and regional history is not affected by the integrity of setting, feeling, and association of the landscape.

Desert Training Center California-Arizona Maneuver Area Cultural Landscape

The Energy Commission designated a discontiguous cultural landscape under CEQA in 2010 (historic district) that incorporates historical archaeological sites associated with Gen. Patton's World War II Desert Training Center California-Arizona Maneuver Area (DTC/C-AMA) in the Chuckwalla Valley and on the Palo Verde Mesa, to be known as the Desert Training Center Cultural Landscape (DTCCL). The BLM has nominated a

variant of the same district to the NRHP several times. Each time the Keeper of the National Register rejected the nomination, mainly because the resource was not yet 50 years old at the time of nomination. As part of the nomination process, BLM sponsored a detailed archaeological study of the resource which resulted in the publication of a formal cultural context (Bischoff 2000).

Staff notes that the resource is now more than 50 years old. The NRHP guidance for districts and cultural landscapes requires identifying certain characteristics, including boundaries, one or more periods of significance, thematic associations, and property (resource) types. As conveyed in the September 2010 Revised Staff Assessment (RSA) for the original project, the boundaries of the DTCCL need to be refined, based on the historical record. The period of significance is 1942–1944. The thematic associations include the nation's preparation for World War II, U.S. Military Training, Gen. George S. Patton, Jr., and Gen. Walton Walker. The DTCCL site types include depots, airfields, ranges, bivouacs, maneuver areas, camps, and hospitals; and others that may be defined later.

The Energy Commission determined that the DTCCL is eligible for listing on the NRHP under Criteria A and D (CRHR Criteria 1 and 4). The DTC/C-AMA was the largest and the only such military training facility in American military history. The training that took place here undoubtedly helped to win World War II. Most property types associated with the DTC/C-AMA, across the full extent of the resource, exist today as archaeological resources, such as refuse deposits, tank tracks, foxholes, and bivouacs. These sites have the potential to be primarily eligible under NRHP Criterion D (CRHR Criterion 4) for their ability to yield information important in history. Other property types such as the airfields, camps, and hospitals are potentially eligible for listing under Criterion A (CRHR Criterion 1).

Military records report that Chuckwalla Valley and portions of the proposed project site were primarily used as maneuver areas, campsites, and small group training areas. Here soldiers practiced desert survival and infiltration techniques. The remains of these smaller exercises are undoubtedly more ephemeral than those involving whole army divisions (e.g., 15,000 men), however, evidence may still be present. Artifacts and any features associated with them would most likely be shell casings, grenade containers, foxholes, C-ration cans, and other refuse (Bischoff 2000, p. 116). Evidence of these specific activities are most likely still present within and far beyond the PSEGS facility site.

The DTCCL is a vast resource extending well beyond the original archaeological PAA. At present count, there are approximately 36 potential contributors within the project site that need to be confirmed as clearly associated with the DTCCL, the corral (SMP-H-2016) and 35 can scatters (some with associated tank tracks). These sites are expected to be subject to direct impacts from the PSEGS. The information provided in the original AFC was not sufficient to allow staff to determine the eligibility of these resources, thus eligibility is assumed. As such, the Energy Commission previously determined that impacts to them, if unavoidable, would be mitigated by data recovery. The PSEGS would contribute to a cumulative impact to numerous other resources in the vicinity that

will be subject to direct impacts as future projects are approved, including but not limited to Desert Center Airfield, Camp Desert Center, Observers Camp, 36 Evacuation Hospital, and Ordnance Depot.

Assessment of Project Impacts to Individual Cultural Landscapes and Recommended Mitigation

Pacific to Rio Grande Trails Landscape (PRGTL), (Formerly, Prehistoric Trails Network Cultural Landscape (PTNCL))

The construction of the amended project would cause a substantial adverse change in the significance of the Chuckwalla Valley portion of the Pacific to Rio Grande Trails Landscape (PRGTL). The Chuckwalla Valley portion of the PRGTL is a constellation of archaeological and ethnographic resources that evidence and convey an important part of the prehistoric narrative of Native American travel and interaction across southern California and into the Southwest and beyond. Staff, for the purpose of the present regulatory analysis, has assumed these resources to be significant as elements of that narrative, elements that embody associative and information values of the PRGTL. This portion of the landscape is most likely significant for its association with particular events and sequences of events that have made an important contribution to the broad patterns of the Native American prehistory and history of the Chuckwalla Valley region (CRHR Criterion 1), and for the potential importance for the information that the landscape may be able to provide about the prehistory and history of Native American life in the region (CRHR Criterion 4). The construction and operation of the amended facility would unquestionably degrade the landscape's value under Criterion 1 due to the stark visual intrusion the facility would have across the valley. The landscape would have to retain enough integrity of setting, feeling, and association to be able to convey its associative values if the amended project were not to have a significant effect on it. Staff believes that the construction and operation of the amended project implicitly precludes this outcome.

The presence of the proposed facility's two heliostat fields and particularly the two, approximately 750 foot-tall solar power towers would introduce stark visual intrusions on the landscape that would profoundly and irreparably degrade the ability of the landscape to convey its historical significance under CRHR Criterion 1. The mass of the looming towers in particular, in combination with the operational glare of the solar receiver steam generators atop each tower and the bright haze of the operational solar flux field, would compromise the setting, feeling, and association aspects of the Chuckwalla Valley portion of the PRGTL's integrity, aspects critical to the resource's ability to convey its associative values under Criterion 1. Subsequent to the construction of the facility, one would no longer be able to experience the sense of the landscape as it was during its period of significance. The baseline presence of the Interstate Route 10 and State Highway 177 corridors, the community of Desert Center, and the Desert Sunlight Solar Farm and the Genesis Solar Energy Project has contributed somewhat to the visual degradation of the landscape. The character of Chuckwalla Valley, however, greatly attenuates this degradation. The broad, low angle sweep of the valley tends to mask these roads and structures, and helps preserve the sense of its remote and

natural essence. The presence of the solar power towers would significantly intrude on the broad, relatively undisturbed expanses of the balance of the landscape. The towers would loom large over the valley floor nearer the facility site, while the solar receiver steam generators, when online, would hover brilliantly high in the air, imposing their environmentally incongruous and intrusive character far across the valley. Staff concludes that the construction of the amended project, its indefinite period of operation, and the indefinite period of the presence of the facility's infrastructure on the land would result in a significant impact on the Chuckwalla Valley portion of the PRGTL, an historical resource; and would require mitigation under CEQA.

The significant effect of the proposed project on the Chuckwalla Valley portion of the PRGTL would not be mitigable if the project is constructed as designed in the proposed location. Given the indefinite period of both the proposed project's operation, a minimum of at least 30 years, and the long-term physical presence of the proposed power towers on the land, the effect of the towers' presence on the landscape can, in essence, be considered permanent. Once the towers are present and the facility is operational, the visual integrity of the landscape would be lost. Staff does not believe that there is any feasible way to mask the visual presence of the towers or the solar receiver steam generators. Staff is also unaware of any mitigation measures that would reduce the loss of an entire landscape or a significant portion of one to a less than significant level. To substantively reduce the visual effects of the proposed project on the Chuckwalla Valley portion of the PRGTL to a less than significant level, the project owner would need to provide for compensatory mitigation that attenuates the magnitude of the project's visual effects on the subject portion of the landscape over the entire span of time that the amended facility would be present there. Staff does not believe that any suite of mitigations would be found to be feasible. Staff does believe, however, that it is possible to devise feasible suites of mitigations to meaningfully reduce these visual effects. The project owner has (at the time of FSA publication) not considered potential historical resources outside of that boundary of the proposed facility site and therefore, the owner has not provided analysis on the subject landscape and related mitigation to reduce the amended project's effects on it. Staff nonetheless concludes that the amended project's anticipated effects on the Chuckwalla Valley portion of the PRGTL would be significant and that it would be infeasible to reduce these significant effects to a less than significant level. Staff does however propose a suite of compensatory mitigation through revisions to Condition of Certification **CUL-1** that, while not reducing the amended project's effects to a less than significant level, would serve to ameliorate the loss of the Chuckwalla Valley portion of the PRGTL's ability to convey its associative values.

Staff's proposed revisions to Condition of Certification **CUL-1** would seek to capture a comprehensive picture of the associative values of the Chuckwalla Valley portion of the PRGTL, and attempt to re-create or to engender at least some sense of the experience of the landscape for the general public through the landscape's description and through different modes of landscape interpretation. The intent behind the landscape's description and interpretation would be to try, to the extent feasible, to compensate the individual members of the public for what would be the potential loss of their ability to ever experience, first-hand, the multiple associate values that the landscape has to convey. While the loss of the ability to step into the existential experience of a relatively

intact historical resource on the scale of a landscape can never be fully mitigated through documentation and public presentations of that resource, staff believes it nonetheless to be in the public interest to gather the information and disseminate it in order to both compensate the public for the degradation of the landscape itself, and, secondarily, to foster a more comprehensive appreciation of the potential landscape costs of utility-scale renewable energy development.

The effort to describe the Chuckwalla Valley portion of the PRGTL entails three types of field investigations. The foundation of the descriptive effort is the design and execution of a series of class II pedestrian surveys of the thematic areas (Palen, Coxcomb, Eagle, Chuckwalla, and McCoy Mountains Resource Areas, Coxcomb Fringe and Raceway Mesquite Areas, and the Palen Dry Lake ACEC) that have been identified within the subject portion of the PRGTL (see *Potential Elements of the Chuckwalla Valley Portion of the Pacific to Rio Grande Trails Landscape, Formerly the Prehistoric Trails Network Cultural Landscape* subsection, above). The purpose of the proposed surveys is to partially compensate the public for the degradation of this portion of the PRGTL through the recordation of samples of the presently known constituent thematic areas in the landscape and the presently known constituent archaeological deposits and ethnographic places within those areas, all assumed, of regulatory necessity, to be eligible for listing in the CRHR as individual and composite resources that contribute to the historical significance of the Chuckwalla Valley portion of the subject landscape and, further, all assumed to be subject to substantial adverse changes in their significance as historical resources due to the direct visual effects of the amended project's construction and operation.

The primary effort to more thoroughly and definitively describe the resource would be augmented through the execution of a petroglyph study and a paleoenvironmental study. The petroglyph study would analyze and interpret many of the presently known petroglyph locales throughout the Chuckwalla Valley portion of the PRGTL, and weave a narrative of the ways in which these motifs may have worked to bind places and landforms with cosmology, myth cycles, and oral history to form the aboriginal concepts that were and are the subject cultural landscape. The paleoenvironmental study would potentially provide a reconstruction of the dynamic ecological character of the Chuckwalla Valley through time, of the environmental stage across which the PRGTL swept and relative to which its control and use was shaped. Both investigations would serve to more completely compensate the public for the degradation of this portion of the PRGTL, and for the degraded existential experience of it.

One further effort to facilitate the description and interpretation of the Chuckwalla Valley portion of the PRGTL would be to revise both the draft context of the Prehistoric Trails Network Cultural Landscape (PTNCL) and the draft field manual prepared for future recordation work for that landscape. The revision of the extant draft context would provide the opportunity to recast the prior conception of the PTNCL as simply one subset of the broader PRGTL and to fold in the new data about the Chuckwalla Valley portion of the latter landscape that would be the result of the three efforts above, the class II pedestrian surveys, the petroglyph study, and the paleoenvironmental study. Once in hand, the revised context would be used to inform the different public outreach

initiatives which would most directly compensate the public for their loss of the experience of the landscape. The revision of the draft field manual would help to better manage the preservation of future recordation efforts for the landscape and to stream more consistent and finer resolution data into subsequent public outreach initiatives.

Staff recommends several different public outreach initiatives in **CUL-1** that would provide the general public and interested Native American communities intellectual access to the Chuckwalla Valley portion of the PRGTL. These initiatives include the production and distribution of a video or other internet content to interpret the landscape for the general public, and programs that interested Native American communities develop and administer. Taken together, the public outreach initiatives are the consumer products that, to whatever extent they can, would compensate both the general public and the Native American public for their respective losses of their respective potential experiences of the associative values that the Chuckwalla Valley portion of the PRGTL would have offered.

Desert Training Center California-Arizona Maneuver Area Cultural Landscape

The construction of the amended project would cause a substantial adverse change in the significance of the Chuckwalla Valley portion of the Desert Training Center Cultural Landscape (DTCCL). As discussed above for the PRGTL, the direct visual effects of the amended project, due to the change in the project's solar thermal technology, are far greater than those of the licensed project. The conclusions and the conditions of certification (**CUL-2**, **CUL-13**–**CUL-15**) that relate to the DTCCL from the original license, as such conclusions and conditions concern how the licensed project would physically affect DTCCL-related historical archaeological deposits on the facility site and what the extent of the cumulative effects of the licensed project would be on those same deposits, remain intact and unchanged, as the amended project would have roughly equivalent direct physical effects to such deposits on the facility site.

All CRHR-Eligible Resources Subject To Potential Project Impacts

Cultural Resources Table 19 lists, by resource type, the CRHR-eligible cultural resources potentially impacted by the project and the recommended conditions of certification that would mitigate, to the extent possible, the amended project's significant impacts.

Cultural Resources Table 19
CRHR-Eligible Cultural Resources Potentially Subject to Impacts from the Proposed Project and Recommended Mitigation

Resource Type, Designation	**Resource Description** [type, size, age,]	**Recommended Conditions to Mitigate Impacts**
Prehistoric Archaeological Resources		
SMP-P-2018	Lithic & FAR scatter	**CUL-12**
SMP-P-2023	Lithic & FAR scatter	**CUL-12**
SMP-P-MT-001	Lithic scatter	**CUL-11**
Buried archaeological resources that may be discovered during construction monitoring or identified during survey of potential soil borrow and disposal sites	Unknown	**CUL-1** through **CUL-8**, and **CUL-12** and **CUL-13**; would provide for the appropriate identification and treatment of potential CRHR-eligible archaeological resources discovered during construction-related activities.
Historical Archaeological Resources	DTC Cultural Landscape	**CUL-2** would provide mitigation for and treatment of potential CRHR-eligible archaeological resources discovered during construction-related activities related to the DTCCL.
	Mining District	**CUL-1**

Resource Type, Designation	**Resource Description** [type, size, age,]	**Recommended Conditions to Mitigate Impacts**
Ethnographic Resources	11 Potential Traditional Cultural Properties 1. Palen Dunes/Palen Lake 2. Ford Dry Lake 3. McCoy Spring (CA-RIV-0132) National Register District 4. Chuckwalla Springs 5. Corn Spring (CA-RIV-032) 6. North Chuckwalla Mountains Petroglyph District (CA-RIV-01383) 7. North Chuckwalla Mountains Prehistoric Quarry District (CA-RIV-01814) 8. Long Tank 9. Alligator Rock 10. Dragon Wash (CA-RIV-049) 11. San Pascual Well	**CUL-1**
Built-Environment Resources	Town of Desert Center	**None**
	Eagle Mountain Railroad)	**None**
	Colorado River Aqueduct (incl. Eagle Mountain Pumping Plant	None

CUMULATIVE IMPACTS AND MITIGATION

GEOGRAPHIC SCOPE OF ANALYSIS

Table 1, Palen Master List of Cumulative Projects, and the **Cumulative Projects Figure 1**, included in the Cumulative Impacts Assessment **EXECUTIVE SUMMARY** of the FSA, identify the development projects that may contribute to cumulative impacts on cultural resources in combination with the proposed PSEGS project. These include the Genesis Solar Power Project (09-AFC-8C) and the Blythe Solar Power Project (09-AFC-6C). These projects are located within a geographic area that has been identified by staff as covering an area large enough to provide a reasonable basis for evaluating cumulative impacts for all resource elements or environmental parameters. Most of these projects would be required to undergo their own independent environmental review under CEQA.

Cumulative impacts could occur if impacts resulting from the implementation of the proposed project combine with the impacts of other local or regional projects on the same or similar resources. Cumulative impacts would occur locally if the PSEGS impacts combined with the impacts of projects located within the area identified in **Cumulative Projects Figure 2**. Cumulative impacts could also occur as a result of the development of some of the many proposed and licensed solar and wind development projects that have been, or are anticipated to be, constructed in the foreseeable future. This geographic scope is appropriate because it is likely that cultural resources similar to those in the PSEGS PAA are present throughout the Chuckwalla Valley.

In the RSA for the original siting case it was determined that there would be a cumulatively considerable impact to cultural resources. At this time staff anticipates that the amended project will have a greater impact than the originally licensed project, both at the project and cumulative levels; therefore, the already cumulatively considerable impact from the originally proposed project will be an even greater cumulatively considerable impact with the amended project. As such, as it is discussed in the "Recommended Conditions of Certification" subsection below, the magnitude of the mitigation measures will be adjusted accordingly.

PROJECT CUMULATIVE IMPACTS AND MITIGATION

I-10 Corridor

At the local level, the construction of Chuckwalla Valley and Ironwood State prisons probably caused the most disturbance in the I-10 Corridor. Together these projects have disturbed approximately 1,720 acres of culturally sensitive desert. The analysis suggests that 29 sites were destroyed during these projects, five of which may have been eligible for the NHRP and the CRHR.

The construction of I-10, a four-lane divided highway, with associated bridges, off-ramps, and berm system, also resulted in significant ground disturbance in the Corridor. Assuming a width of a minimum of 200 feet and a length of 48 miles, within the I-10 Corridor this project disturbed approximately 10,137,600 square feet (2,328 acres). The

analysis suggests that 40 sites were destroyed during this construction, seven of which were eligible for the NHRP and the CRHR.

Another linear project within the I-10 Corridor is the Devers-Palo Verde transmission line, a 500-kV line paralleling I-10. The disturbance caused by the construction of transmission lines is generally less than the disturbance caused by freeway construction. However, each line has an associated access road. Based on the construction of the access road and excluding the transmission tower pads, a width of 20 feet for each project and a length of 48 miles were assumed for this analysis. A similar calculation was made for the Blythe-Eagle Mountain Transmission Line and a natural gas line, both of which were constructed parallel to I-10. This analysis estimates that during the construction of these three linear projects, approximately 350 acres were disturbed, and 6 cultural resources were destroyed, 1 of which was likely to be eligible for the NHRP and the CRHR.

Finally, the mining activities at the Kaiser Eagle Mountain mine may have disturbed more than 3,500 acres. Several plans for the use of this disturbed area have been proposed, but, from the perspective of cultural resources, new projects would be unlikely to cause more damage than has already occurred.

In total, together, the larger of the ground-disturbing projects within the I-10 Corridor disturbed at least 7,898 acres, or 6.4 percent of the Corridor. One hundred and thirty-three of the estimated 2,081 cultural resources were likely destroyed by these projects. Of the 367 cultural resources that would have been eligible for the NHRP and the CRHR, 23 would have been destroyed. Overall, previous projects in the I-10 Corridor do not appear to have a significant adverse affect on the cultural resources. However, certain site types, particularly those associated with dry lakes may have been disproportionately affected.

Archaeological and Ethnographic Resources

The prehistoric archaeological and ethnographic resources that staff now identify as subject to significant visual degradation from the construction and operation of the amended project are together bound in interrelated historical themes to the broad Chuckwalla Valley portion of the Pacific to Rio Grande Trails Landscape. Many of the historical archaeological resources in the valley are further bound in Desert Training Center Cultural Landscape themes. The cultural resources analysis for the original licensing case already found the cumulative impact of the original project on the relatively small inventory of prehistoric and historical archaeological resources on the then-proposed facility site to be cumulatively considerable and not mitigable to a less than significant level. Given that the amended project has the potential to cumulatively impact ethnographic and archaeological resources, and affiliated Indian tribe environmental justice populations across an area of approximately 452,000 acres, staff clearly must conclude that the amended project's visual degradation to those resource would be cumulatively considerable and largely unmitigable.

Built-Environment Resources

While the cumulative effect of industrialized development within the I-10 corridor with the addition of the PSEGS would continue the degradation of the broader setting and association for the town of Desert Center as a traveler's way-stop in the early 20th Century, it would not impact the integrity of that historic resource unless there were project features that disturbed the integrity of the spatial relationships (location), materials, workmanship and design of the core structures considered potentially-eligible as a historic district. Cumulative effects on the Eagle Mountain Railroad would only have an impact on the railroad if a project would require removal of portions of the rail line. The same can be concluded for the Colorado River Aqueduct and the Eagle Mountain Pumping Plant, both of which are unlikely to be affected by the cumulative impacts from development in the Chuckwalla Valley. Therefore, staff concludes that it is unlikely that built-environment resources would be impacted in a significant and adverse manner by the cumulative industrial development in the I-10 corridor and the Chuckwalla Valley.

Project Cumulative Impacts Conclusion

Staff concludes that the approval of the amended project would result in cumulatively considerable and unmitigable impacts to, principally, the Chuckwalla Valley portion of the Pacific to Rio Grande Trails Landscape (PRGTL) and the Desert Training Center Cultural Landscape (DTCCL), and, to lesser extents, and the Ironwood Historic Mining District, among other potential individual cultural resources. Staff believes that the compensatory mitigations that have been developed here for the direct visual impacts of the amended project to these resources, in combination with the mitigations developed for the former Prehistoric Trails Network Cultural Landscape (now subsumed within the PRGTL) and the DTCCL in the original licensing case, are together sufficient to also function as reasonable attempts to mitigate for the largely unmitigable cumulative impacts of the amended project's visual presence on historical resources and affiliated Indian tribe environmental justice populations. Staff therefore recommends that the compensatory mitigations recommended here for the above resources be found to satisfy the Energy Commission's obligations under CEQA to try and mitigate for the full suite of the amended project's unmitigable impacts, cumulative and otherwise.

COMPLIANCE WITH LORS

Staff concludes that with the adoption and implementation of staff's recommended cultural resources Conditions of Certification, the PSEGS would be in conformity with all applicable LORS. **CUL-1** and **CUL-2** would reduce the project's direct and cumulative impacts to the greatest extent possible, but those impacts would not be reduced to a less than significant level. Staff believes that **CUL-3** through **CUL-10** remain adequate to mitigate potential inadvertent direct physical impacts that could result from the construction of the amended project. Staff also believes that **CUL-11** through **CUL-15** would still reduce direct physical impacts to historical resources on the facility site to a less than significant level. Staff recommends **CUL-17** as mitigation for the direct visual degradation of the amended project on historical resources further removed from the facility site.

NOTEWORTHY PUBLIC BENEFITS

While the development of the amended project is intended to address the requirements of federal and state mandates to develop renewable energy, it would not yield any noteworthy public benefits related to cultural resources.

RESPONSE TO AGENCY, TRIBAL AND PUBLIC COMMENTS

Staff has received 10 letters of comment from tribes and interested parties.

- Letter from Agua Caliente Band of Cahuilla Indians, 26 March 2013
- Letter from Soboba Band of Luiseno Indians, 11, April 2013
- Letter from Colorado River Indian Tribes, 29 July 2013
- Letter from Quechan Indian Tribe, 27 August 2013
- Letter from La Cuna de Aztlan Sacred Sites Protection Circle, 21 January 2013
- Letter from La Cuna de Aztlan Sacred Sites Protection Circle, 15 March 2013
- Letter from La Cuna de Aztlan Sacred Sites Protection Circle, 20 August 2013
- Letter from Palen Solar Holdings, LLC 27 July 2013
- Letter from Basin and Range Watch, 29 July 2013
- Letter from County of Riverside, 30 July 2013

The comments and staff responses are summarized below.

COMMENTS IN LETTER FROM AGUA CALIENTE BAND OF CAHUILLA INDIANS

Comment: The letter writer, Patricia Garcia-Tuck, Director of the Tribal Historic Preservation Office (THPO) notes the project is within the tribe's Traditional Use Area, and the THPO has identified recorded cultural resources and/or sacred place names in the project area and/or in very close proximity to the project boundaries. The THPO states they have requested formal consultation with the CEC and BLM on the project, and their desire to be included in project information and meetings. The letter further states that the THPO considers the cumulative impacts (the inference being this and other solar energy projects in the Interstate 10 vicinity such as Genesis Solar Energy Project and Blythe Solar Power Project) to cultural resources, historic resources, Traditional Cultural Places, sacred places, gathering places, trails and all of the cultural landscapes immeasurable and immitigable. The letter concludes by requesting several items of information concerning the amendment including maps of ethnographic, prehistoric and historic resources in the project area, GIS shapefiles of base and cultural mapping prepared to date, original source materials for the ongoing ethnographic study for the project amendment, and copy of the water impact report for the original project and for the amendment.

Staff Response: The comments are duly noted and acknowledged with regard to cumulative impacts of this and other projects in the vicinity.

Staff provided all of the tribes expressing interest in the project responses and links to the information requested in the THPO's letter, except those items which require a formal Petition request and Confidentiality Agreement due to sensitivity content regarding cultural resources and locations. At the time of this report, none of the tribes have filed a Petition for confidential information or requested a Confidentiality Agreement. In addition, because the project is proposed for BLM lands, the CEC cannot provide tribes with cultural resources data for cultural resources located on BLM lands. That information can only be released by and from the BLM.

SOBOBA BAND OF LUISEÑO INDIANS, JOSEPHE ONTIVEROS, COMMENT LETTER, TN # 70632, APRIL 11, 2013

Comment: The letter writer, Joseph Ontiveros, Director of Cultural Resources for the tribe, notes that the Palen project area is within the Soboba Band's Tribal Traditional Use Areas, and is regarded as highly sensitive to the people of Soboba. The Soboba Band of Luiseño Indians also requested that:

1. the project developer and the BLM initiate a consultation with the tribe;

2. the tribe be apprised of any information pertinent to the progress of the project;

3. Native American Monitor(s) from the Soboba Band of Luiseño Indians Cultural Resource Department be present during any ground disturbing proceedings, including surveys and archaeological testing.

4. That remains, items or objects given special consideration per the Native American Graves Protection Act (NAGPRA) and California Public Health and Safety Code 7050.5 be handled per the request of the tribe.

Staff Response: The comments are duly noted, and staff has been in regular communication with the tribe on this and other related projects in the area. A representative from Energy Commission also met in person with the tribe the week of May 20th-24th, 2013). **CUL-5** in the proposed conditions of certification requires the preparation of a Cultural Resources Monitoring and Mitigation Plan (CRMMP), including provisions for on-site monitoring, for review and approval by staff prior to commencement of any ground disturbing activities. State Health and Safety Code 7050.5 is not applicable for this project because all involved land is federal. Should monitoring result in discoveries that trigger NAGPRA, then treatment and handling of such remains, items or objects is subject to BLM processes and related tribal consultations.

COMMENTS IN THE LETTER FROM THE COLORADO RIVER INDIAN TRIBES

Comment: The letter is signed by the Amelia Flores, acting on behalf of Wayne Patch Sr., Chairperson of CRIT.

1. The letter notes that the area is part of a larger cultural landscape, understood through stories and songs, that includes plants, animals, gathering places, petroglyphs and trails. The tribe expresses concern for the degradation of the landscape and notes that the tribe's perceived landscape is much broader in scope and period then the previously defined Prehistoric Trails Network Cultural Landscape (PTNCL).

2. Critiquing the lack of information in the Preliminary Staff Assessment (PSA), the tribe requests a revised and more complete PSA be promulgated prior to the publication of the Final Staff Assessment, allowing for more time for more complete staff analysis and opportunity for tribal review and comment.

3. Advises that potential visual impacts are not the only impacts to analyze, and citing sub-surface discoveries made at the nearby Genesis project warns that the Palen Project will likely result in similar discoveries.

4. Suggests that the Key Observation Point analysis does not adequately take into account tribal visual values that can only be understood through further consultation.

5. Requests that the tribal monitoring conditions as laid out in the Cultural Resources Monitoring and Mitigation Plan (CRMMP) should be revised to provide cultural monitors with greater authority to halt projects and require that additional tribal consultation occur upon discovery. The tribe also requests that the CRMMP undergoes tribal review and is subject to tribal consultation prior to finalization.

6. Objects that project alternatives were not analyzed in the PSA.

7. The PSA fails to adequately address environmental justice considerations as applicable to tribes.

Staff Response: Staff has diligently worked to revise the Prehistoric Trails Network Cultural Landscape to reflect the broader scope and period of significance that CRIT suggests is appropriate and applicable. The revised cultural landscape is labeled throughout the FSA as the Chuckwalla Valley portion of the Pacific to Rio Grande Trails Landscape (PRGTL). While staff has not been able to conduct ethnographic interviews with CRIT tribal members, this is not due to staff lack of attempt to conduct such interviews. A draft agreement remains in negotiation between the Energy Commission and Colorado River Indian Tribes. In the meantime Staff has sought the expertise of tribal people that are culturally affiliated to the Chuckwalla Valley that are not CRIT tribal members. Staff will consider that a draft CRMMP be subject to tribal review and comment prior to staff approval of the CRMMP. Staff acknowledges that alternatives analysis was not included in the PSA but directs the reader to pertinent alternative

sections in the FSA. Staff continues to attempt to address environmental justice issues as applicable to tribal values and notes that guidance lacks direction on how to mitigate any significant impacts. While the PAA is within several tribes' claimed ancestral or traditional use territories, there is no current environmental justice method for analyzing impacts to such territorial or use claimants. Staff suggests that the cultural landscape approach is an attempt to consider impacts to what the tribes perceive to be immediately at risk with the consideration of the proposed amendment.

COMMENTS IN LETTER FROM QUECHAN INDIAN TRIBE, HISTORIC PRESERVATION OFFICE

Comment: The letter writer provides several general and several specific comments.

Generally the area is identified by Quechan through songs and stories, and these oral traditions plus the plethora of archaeology throughout the area attest to the cultural, religious and spiritual importance and reciprocal stewardship that the Chuckwalla Valley and its indigenous inhabitants engaged. The tribal letter asserts that an Environmental Justice issue exists because the tribe cannot compete with the agency and the PSEGS owners' resources to propose, analyze and deliberate on the amendment. For example they make note that the tribe was without electricity and electronic communication for an indeterminate period time and cite an adjacent but unrelated project is perceived by tribes to be a case in point on how the tribes were not adequately consulted and the agency and development wills were imposed over that of affiliated tribes.

Specifically the letter writer provides the following comments:

1. requests that the more time is needed for review since the PSA was incomplete,

2. suggests that an environmental justice issue exists because the tribe does not have comparable resources for analyzing the project,

3. suggests that a solar photo voltaic alternative would have less overall impact,

4. argues that there will be a visual impact to the sky,

5. requests that compliance, monitoring and mitigation plans undergo tribal consultation,

6. identifies that there is no analysis of culturally sensitive biological resources, and

7. states that ethnographic studies should be conducted as part of the assessment rather than as mitigation.

Staff Response: Staff suggests that the efforts to link ethnographic resources, archaeological resources and related natural resources (of cultural sensitivity) into one holistic cultural landscape and assess impacts accordingly goes some distance to addressing the tribe's concerns. Without denying that the tribe constitutes an environmental justice population, staff does not consider the tribe's claims for environmental justice (as expressed in the letter sent as comment to the PSEGS PSA)

to be commensurate with the intent of environmental justice order and guidance. Staff duly notes the tribal suggestion that a solar photo voltaic alternative is the least impacting and defers the reader to an analysis in the FSA alternatives section. Visual impacts to cultural resources are exactly the types of impacts staff analyzed; and staff concluded that the proposed solar power technology would impact a cultural landscape. Staff will provide opportunity for the tribe to comment on compliance, monitoring and mitigation plans that are germane to tribal cultural interests. Staff responds to the critique concerning absence of staff assessment of impacts to culturally sensitive plant and animal species by saying that this is not a required assessment. However the FSA biology section does assess impacts to listed species, some of which are culturally sensitive. Finally staff points out that an ethnographic study was conducted by staff prior to the FSA, this document was developed with opportunity for tribal involvement and comment and that the ethnographic study provides one source or basis from which staff derived a cultural landscape.

LA CUNA DE AZTLAN SACRED SITES PROTECTION CIRCLE, ALFREDO A. FIGUEROA, COMMENT LETTER, TN # 69254, JANUARY 21, 2013

Comment: The letter writer, Alfredo Acosta Figueroa, expresses opposition to the project, on the basis it could harm or destroy a number of culturally-important resources, including:

1. the main historic trail and a connecting trail between Palen Mountain, Mule Mountains, Corn Springs and Aztec Well;

2. Poor-will Bird hibernating sites and pristine desert;

3. the contextual significance of a number of sacred sites and geographic features including the Chuckwalla, Eagle, Palen, Granite, McCoy, Mule, and Little Maria Mountains; Dragon Wash; Ripley Intaglio and geoglyphs, pictographs, rock art and petroglyphs known to exist in the area and that reflect the Azteca/Mixteca originating homelands.

Staff Response: During the data adequacy phase of review for the proposed amendment, staff identified significant concern with the potential for the two solar power towers and heliostat fields to degrade the visual environment of the areas and negatively impact the use of known cultural resources and sites within the expanded PAA. Staff has concluded that there will be significant visual impacts to cultural landscape that takes into account tribal values related to the cultural landscape and its contributing attributes. Some of the contributing attributes are the same places that are of concern to La Cuna de Atzlan.

GALATI BLEK/MARIE FLEMING/PALEN SOLAR HOLDINGS, LLC, COMMENTS ON PSA, TN # 200077, JULY 29, 2013:

Comment: *Project owner notes that the impetus for staff's revision to **CUL-8** was not, in the project* owner's opinion, due to any proposed modification to the licensed project. Project owner notes, however, that they do not object to the revision. Project owner proposes greater specificity about the circumstances under which full-time archaeological monitoring would be required. The project owner further proposes the deletion of Verification No. 7, which requires the project owner to respond to any Native American requests to monitor construction, because, in the project owner's opinion, it is redundant with the extant requirement in the body of **CUL-8** to retain the services of Native American monitors.

The project owner proposes a revision of Verification No. 1 of **CUL-11** that would have the effect of allowing construction to proceed up to 30 meters from the boundary of each prehistoric deposit called out in that condition. The project owner opines that this revision would bring Verification No. 1 in line with what the project owner appears to view as analogous provisions elsewhere in the original license related to the assessment and treatment of historical resources that are discovered or that are affected in an unanticipated manner during the course of construction.

The project owner proposes modification to subpart No. 2 of **CUL-12** to reflect more recent geomorphic data now available for Palen Dry Lake. The project owner also proposes to revise Verification No. 1 of **CUL-12** in the same manner that they wished to revise Verification No. 1 of **CUL-11**.

The project owner proposes to revise **CUL-13** and **CUL-14** to reflect the amended project rather than the Reconfigured Alternatives Nos. 2 and 3 called out in the original license. The project owner also proposes to revise Verification No. 1 of **CUL-13** in the same manner that they wished to revise Verification No. 1 of **CUL-11**.

The project owner again proposes to preserve **CUL-16**.

Staff Response: Staff does not object to the project owners request for greater specificity in **CUL-8** with regard to full-time archaeological monitoring and accepts the project owner's proposed language. Staff chooses to not recommend the project owner's proposal to strike Verification No. 7 from **CUL-8**. The purpose of this verification is to preserve for the Native American community at large the opportunity to question and participate in the construction process. It preserves the Energy Commission's open and transparent public process. Staff would like to note here that the impetus for the revisions which staff made to **CUL-8** for the PSA and which staff still recommends is the experience that staff has accrued as a result of enforcing this same basic condition on other solar energy projects around the Mojave Desert. The purpose of the revisions is ultimately to facilitate more efficient and effective construction monitoring for archaeological resources.

Verification No. 1 of **CUL-11**, as set in the Energy Commission's Final Decision for the original project, provides appropriate treatment for resources that had to be assumed to be historically significant during the original proceeding. The treatment of a known, historically significant resource, determined or assumed significant, is not analogous to mid-construction discovery scenarios. Discovery scenarios are implicitly surprise scenarios that all parties agree to deal with the best that they can. They are unanticipated and follow the exercise of due diligence to assess and provide mitigation for a proposed project's effects. The known, assumed CRHR eligible prehistoric archaeological deposits are not surprises and should receive the full measure of the appropriate historic preservation treatment afforded them in the original proceeding. Staff therefore declines to recommend the project owner's proposal in this case. Staff would, however, be amenable to any proposal from the project owner that would tie the their need to notify the CPM that data recovery for simple prehistoric sites had been completed to project owner-identified construction phases, rather than to the facility site as a whole. Staff would also be open to analogous proposals for **CUL-12** through **CUL-15**.

Staff does not object to the revisions in **CUL-12** related to the new geomorphic data. Staff declines to recommend the project owner's proposal to modify Verification No. 1 of **CUL-12** for the same reasons that staff was disinclined to recommend the same proposal for Verification No. 1 of **CUL-11**.

Staff has revised the bodies of **CUL-13** and **CUL-14** in a manner that is congruous with the project owner's proposal. Staff declines to recommend the project owner's proposal to modify Verification No. 1 of **CUL-13** for the same reasons that staff was disinclined to recommend the same proposal for Verification Nos. 1 of **CUL-11** and **CUL-12**.

For the reasons first set out in the PSA and preserved here, staff continues to recommend the deletion of **CUL-16**.

STATE OF CALIFORFNIA ENERGY RESOURCES CONSERVATIONAND DEVELOPMENT COMMISSION, BASIN AND RANGE WATCH/KEVIN EMMERICH AND LAURA CUNNINGHAM, COMMENT ON PSA, TN # 200078, JULY 28, 2013:

Comment: Basin and Range Watch (BRW) offers the observations that more time appears to be needed to fully consider the amended project's effects to an area that a number of local Native American tribes have clearly indicated is sacred. BRW notes the presence in the vicinity of the project of trail networks, villages, archaeological sites, artifacts, and springs and the songs and oral traditions of the different tribes that relate to these resources.

Staff Response: Staff takes note of BRW's observations. Staff has had congruent concerns and has worked in consultation with the local Native American tribes and within the regulatory confines of CEQA to address these concerns in our allotted timeframe.

COUNTY OF RIVERSIDE/JOHN J. BENOIT, COMMENTS ON PSA, TN # 200094, JULY 30, 2013

Comment: The County of Riverside expresses its concern about the potential visual effect that the amended project would have on cultural resources, agrees with others that these effects need to be subject to more study, and reserves the right to comment further on cultural resources issues after the county has had the opportunity to review new information in the FSA.

Staff Response: Staff takes note of the County of Riverside's observations. Staff has had congruent concerns and has worked within the regulatory confines of CEQA to address these concerns in our allotted timeframe.

CONCLUSIONS, RECOMMENDATIONS, AND RECOMMENDED FINDINGS OF FACT

The primary factor that accounts for the differences in staff's conclusions about the amended project relative to the original project, and in its revised recommendations for mitigation and findings of fact, relate directly to the dramatic increase in the scope of the direct visual effects that the construction and operation of the amended project would have on cultural resources across Chuckwalla Valley. The far greater reach of the visual effects of the amended project draw many more cultural resources into consideration in the present analysis than was the case for the original solar trough project which had a relatively low vertical profile. **CUL-1** has been augmented and **CUL-17** has been added to take the majority of the greater visual effects into account. **CUL-3** through **CUL-15**, which are relatively standard cultural resources conditions, remain largely unchanged. The elimination of **CUL-16** is a function of what staff perceives would be more efficient administration of the conditions as a whole.

Energy Commission cultural resources staff has analyzed cultural resources data currently available for the proposed PSEGS and has concluded that the proposed modified project would have significant direct physical and visual impacts on cultural resources previously listed on the CRHR, or recommended or assumed eligible for that register. These impacts include:

- Direct physical impacts to prehistoric archaeological sites on the facility site, all potential contributors to the PRGTL;
- Direct physical impacts to historical archaeological sites on the facility site, some of which are potential contributing elements to the DTCCL;
- Direct visual impacts to prehistoric archaeological sites, beyond the facility site, which are potential contributors to the PRGTL;
- Direct visual impacts to historical archaeological sites, beyond the facility site, which are potential contributors to both the Ironwood Historic Mining District and the DTCCL;
- Direct visual impacts to a number of traditional cultural places (Palen Dunes/Palen Lake, Ford Dry Lake, McCoy Spring, Chuckwalla Spring, Corn Spring, North

Chuckwalla Mountains Petroglyph District, North Chuckwalla Mountains Prehistoric Quarry District, Long Tank, Alligator Rock, Dragon Wash, and San Pascual Well), ethnographic resources beyond the facility site;and

- Cumulative impacts to the PRGTL, the Ironwood Historic Mining District, and the DTCCL, resulting from the PSEGS's impacts to multiple contributors to these CRHR-eligible resources.

Staff concludes that the construction and operation of PSEGS would produce direct physical and visual impacts, that, when combined with impacts from past, present, and reasonably foreseeable projects, would be cumulatively considerable for cultural resources at both the local I-10 Corridor and regional levels. This analysis estimates that more than 800 sites within the I-10 Corridor, and 17,000 sites within the Southern California Desert Region, will potentially be subject to physical destruction. Mitigation measures can reduce the cumulative impacts of this destruction for PSEGS, but not to a less-than-significant level. To reduce cumulative impacts staff recommends the adoption of **CUL-1** and **CUL-2**. **CUL-1** and **CUL-2**, as originally approved for the already licensed project, would reduce PSEGS's cumulative direct physical impacts by contributing to extant programs to define, document, and, in the case of the DTCCL, nominate to the CRHR the cultural landscapes that PSEGS shares with nearby solar projects. Nearby projects would share the cost of these programs based on the acreage that each project would disturb

To mitigate PSEGS's known and potential direct physical impacts to archaeological resources on the facility site, staff recommends that the Energy Commission adopt cultural resources Conditions of Certification **CUL-3** through **CUL-15**. **CUL-3** identifies the people who would implement all of the conditions, except for **CUL-1** and **CUL-2**, and **CUL-4** specifies the information that the project owner would supply to them. **CUL-5** provides for the preparation and implementation of a Cultural Resources Monitoring and Mitigation Plan (CRMMP), which would structure and govern the implementation of the broader treatment program. **CUL-6** provides for the preparation of a final report to analyze, interpret, and document the ultimate results of the whole PSEGS cultural resources management program. **CUL-7** would provide training of project personnel to identify, protect, and provide appropriate notice about unanticipated impacts to known historical resources on the facility site and about new cultural resources found on the facility site as construction proceeds. **CUL-8** and **CUL-9** would provide construction monitoring and cultural resources discovery protocols. Staff's recommended revisions to CUL-8 reflect the experience that staff has accrued as a result of enforcing this same basic condition on other solar energy projects around the Mojave Desert. The purpose of these revisions is ultimately to facilitate more efficient and effective construction monitoring for archaeological resources. **CUL-10** through **CUL-15** provide treatment for direct physical impacts to archaeological resources on the facility site and would reduce the severity of these particular impacts to a less than significant level.

Staff recommends the adoption of revisions to **CUL-1**, and the adoption of new Condition of Certification **CUL-17** to mitigate the direct visual impacts that would be associated with the construction and operation of PSEGS, impacts that would occur beyond the facility site. The revisions to **CUL-1** reflect the recasting of what was previously the Prehistoric Trails Network Cultural Landscape (PTNCL) as part of a broader regional landscape referred to herein as the Pacific to Rio Grande Trails Landscape (PRGTL). The scope of the analysis of PSEGS' potential to impact the PRGTL is limited strictly to the Chuckwalla Valley portion of the trails landscape. The mitigation for PSEGS' impacts to that portion of the landscape, as set out in the revisions to **CUL-1**, provides for compensatory mitigation in the form of a number of different types of data recovery investigation for archaeological and ethnographic resources, the execution of a paleoenvironmental study to provide significant data to inform an interpretive context for the PRGTL, work to help emplace best management practices for the historic preservation of the landscape, and public outreach initiatives to interpret the landscape for the general public and to support Native American communities ancestral to the valley in their respective efforts to preserve the values that their different communities ascribe to resources of the subject landscape.

The adoption of **CUL-17**takes into account the visual potential of PSEGS to substantively degrade the historical significance of, respectively, potential contributors to an historic mining district, the Ironwood Historic Mining District. The implementation of **CUL-17** would provide for compensatory mitigation in the form of a number of different types of data recovery investigation for archaeological resources in one portion of the district, the Western Palen Mountains Mining Area, and for analyses of historically sampled mineral deposits in that area as key data to inform the interpretive context of the area. Staff recommends that the Energy Commission strike **CUL-16** as the original condition was largely a result of what became disjointed Energy Commission and BLM environmental analysis schedules in 2010. **CUL-16** now ironically has the potential to inadvertently impede constructive collaboration on historic preservation issues relative to the Energy Commission's and the BLM's respective statutory and regulatory processes.

Energy Commission staff's recommended Conditions of Certification **CUL-1** through **CUL-17** reflect staff's determination of what constitutes feasible and appropriate mitigation, under the California Environmental Quality Act, for PSEGS's identified impacts to historical resources, cultural resources eligible for listing on the CRHR. Staff recognizes that BLM's parallel but different process for resolving adverse effects to historic properties under Section 106 of the National Historic Preservation Act (36 CFR Part 800) may result in different conclusions regarding cultural resource evaluations, the nature and severity of project impacts, and appropriate mitigation measures. Staff recommends that the Commission encourage and work with the BLM to incorporate staff's recommended Conditions of Certification into the BLM's amended Section 106 programmatic agreement (PA) and the planning documents that tier from that agreement.

RECOMMENDED CONDITIONS OF CERTIFICATION

With the Energy Commission's December 2010 adoption of the project, which constrained the applicant's development of the project to either Reconfigured Alternative No. 2 or 3, and the adoption of staff's recommended cultural resources conditions, the PSPP was found by the Commission to be in conformity with all applicable laws, ordinances, regulations, and standards (LORS). **CUL-1** and **CUL-2** would reduce the project's cumulative effects to the greatest extent possible, but those effects would still be cumulatively considerable. **CUL-3** through **CUL-15** were found by the Commission to reduce the direct and indirect effects of the approved project to a less than significant level.

Throughout the 2009 and 2010 analysis of the original project, staff's intent was to develop conditions of certification that were closely comparable to the mitigation measures that appeared likely, at the time of the September 2010 publication of the Revised Staff Assessment (RSA), to ultimately coalesce under the Bureau of Land Management's (BLM) National Historic Preservation Act (NHPA) Section 106 consultation process. Although staff and the BLM were unable to jointly develop one set of mitigation measures, staff nonetheless continued to collaborate with the BLM in an attempt to reduce the differences between the mitigations that staff developed as conditions of certification in order to comply with the California Environmental Quality Act (CEQA) and the mitigations that the BLM developed for the agency's Section 106 programmatic agreement (PA). Staff made a well-intentioned recommendation to the Energy Commission in September 2010 to adopt **CUL-16** to try and avoid conflicts or duplications of effort between the separate CEQA and Section 106 mitigation measures. The character of the mitigation measures that would ultimately be in the PA had been unclear during the preparation of the draft RSA, and the PA was executed in October 2010, subsequent to the publication of the RSA. Operating under the assumption that the mitigation measures in the PA would closely mirror the recommended conditions of certification that staff had drafted for the RSA, **CUL-16** subordinated the Energy Commission's conditions of certification to the mitigation measures in the PA with a qualification that the Energy Commission would retain the authority to require mitigation efforts above and beyond the efforts set out in the PA, if that additional effort was necessary to satisfy the project owner's obligations to comply with CEQA under the Energy Commission's license. Although the BLM formally offered staff the opportunity to participate in the PA under the status of an Invited Signatory, the Energy Commission staff declined that offer due to the deferral in the PA of the development of precise mitigation measures until after the approval of the project. On the basis of our ongoing history of constructive collaboration with the BLM, staff believes that it would be able to more effectively regulate the project owner's compliance with the conditions of certification under the license for this project outside of the deferral inherent to **CUL-16**. In cases where the deferral of the development of the details of the mitigation measures in the BLM's PA would ultimately lead to the implementation of measures that would not comply with the Energy Commission's statutory and regulatory obligations under CEQA, rather than being subject to an automatic deferral to a differing, inconsistent or less robust mitigation, staff would be able to simply consult with the BLM to collaborate on a resolution that would satisfy both CEQA and Section 106. On the basis of the history of

the condition's original development and the condition's inadvertent disincentive for constructive collaboration, staff recommends that the Energy Commission strike **CUL-16**.

Staff has made the technical regulatory assumptions and developed the mitigation measures necessary to evidence a thorough consideration of the subject project's potential impacts on any cultural resources in the new PAA. Staff recommends the Energy Commission's adoption of **CUL-1** through **CUL-17**, as revised and drafted here, to demonstrate the agency's compliance with our certified regulatory program under CEQA. With the adoption of these conditions of certification, PSEGS' potential *direct physical impacts* to archaeological resources *on the facility site* would be reduced to a less than significant level although the amended project's cumulative effects to these same resources would remain unmitigable. This preserves the Energy Commission's finding in its original September 2010 decision. The adoption of the conditions would mitigate, to the extent feasible and reasonable, the ultimately unmitigable effects of the amended project's *direct visual impacts* to archaeological, ethnographic, and built-environment resources *beyond the facility site*.

Staff has proposed modifications to the **Cultural Resources** conditions of certification as shown below. (**Note:** Deleted text is in ~~strikethrough~~, new text is **bold and underlined, and ~~bold underline strikethough~~** text is text that is being removed from the condition that was bolded in the 2010 conditions.)

CUL-1 TREATMENT OF THE CHUCKWALLA VALLEY PORTION OF THE PACIFIC TO RIO GRANDE TRAILS LANDSCAPE (PRGTL) ~~PREHISTORIC TRAILS NETWORK CULTURAL LANDSCAPE (PTNCL) DOCUMENTATION AND NRHP NOMINATION~~

Treatment for Direct Visual Effects

Field Inventory and Documentation of PRGTL Contributing Elements

The project owner shall design and conduct reconnaissance pedestrian (class II) surveys of the Palen Mountains Resource Area[32]; the Coxcomb Mountains Resource Area[33]; the Eagle, Chuckwalla, and McCoy Mountains Resource Areas, as these areas are depicted in the FSA; the Coxcomb Fringe and Raceway Mesquite Areas, as also depicted in the FSA; and the BLM's Palen Dry Lake ACEC. The principal purpose of

[32] Staff envisions that the areal scope of the Palen Mountains reconnaissance be limited to the portions of the mountains in Secs. 13, and 24–26, T. 4 S., R. 17 E. and east of those sections into the unsectioned areas of T. 4 S., R. 18 E.; in Secs. 1 and 13, T. 5 S., R. 17 E., and east of those sections into the unsectioned areas of T. 5 S., R. 18 E.; and north of Secs. 31–33, T. 5 S., R. 18 E. into the unsectioned portions of that township.

[33] Staff envisions that the areal scope of the Coxcomb Mountains reconnaissance be limited to the portions of the mountains in Secs. 11 and 14, T. 4 S., R. 16 E. and northwest of those sections into the unsectioned areas of that township; in Sec. 22, T. 4 S., R. 16 E., and north of that section into the unsectioned areas of that same township; and in Sec. 16, T. 4 S., R. 16 E. and northeast into, again, the unsectioned portions of that township.

these surveys is to document a statistically valid sample of the archaeological deposits, and the potential prehistoric and ethnographic sources of natural resources in each of the subject areas. The primary, although not exclusive focus of the surveys shall be prehistoric archaeological resources that have the potential to be eligible for listing in the CRHR under Criteria 1 or 3. Resources encountered would typically include, but would not be limited to, rock art, intaglios, caves or other natural features that may evidence ritual use, apparent altars or shrines, cleared circles, rock alignments, rock cairns, caches, and trail segments. One secondary focus of the surveys shall be natural resource locales, places in the mountain and mesquite resource areas which may have been used as water sources, or places where plant, animal, or mineral resources may have been extracted. Such places may include springs, seeps, tanks, or plunge pools; stands of plants which have the potential to have been food sources or sources of medicinal compounds; habitats of high value animal populations; or mineral resource outcrops or deposits where materials such as high quality toolstones, quartz crystals, or turquoise may have been extracted. Another secondary focus of the surveys shall be any source of paleoenvironmental data such as packrat middens or pockets of perennially moist, organic sediments.

The research designs and the methods used for these class II surveys shall reflect the character of the different resource areas and include thorough documentation of each archaeological resource, natural resource extraction locale, and source of paleoenvironmental data. The sample design and the field methods for each mountain and mesquite resource area shall evidence a balanced consideration of local topographic constraints and the requirement to acquire a statistically valid sample of each area. The project owner shall completely document every archaeological site found on California State Parks DPR 523 Series forms per California State Parks instructions (CA State Parks 1995). The descriptions of resource assemblages and the spatial distribution internal to those assemblages shall be detailed enough on the subject forms to facilitate meaningful archaeological analysis of the surface manifestation of each archaeological resource. Documentation of potential natural resource extraction locales and sources of paleoenvironmental data shall include field notes and photographs of each such locale or source, vicinity and larger-scale location maps, submeter GPS coordinates, and, for rock and mineral sources, hand samples of the rocks or minerals sufficient for formal identification. The research designs for the mountain and mesquite resource areas shall also provide for chronometric, source, and other germane laboratory analyses.

The research design for the BLM's Palen Dry Lake ACEC survey shall include a thorough review of the BLM's extant documentation on the

ACEC and any other extant peer-reviewed and proprietary literature to determine whether a statistically valid sample of the archaeological inventory of the area already exists, and, if that sample does not exist, the project owner shall design and conduct a further class II pedestrian survey to acquire the requisite supplementary data to complete that sample.

The project owner shall provide for Native American involvement in the design and execution of the fieldwork for these surveys, and in the interpretation and presentation of the results of the surveys.

The project owner shall conclude the efforts to inventory and document the above contributing elements of the PRGTL with the preparation and submission of one or multiple, comprehensive technical report(s).

Paleoenvironmental Study

The project owner shall develop, conduct, and prepare a report of a paleoenvironmental study germane to the period of significance for the Chuckwalla Valley portion of the PRGTL. The purpose of the study is to provide an updated and more reliably informed paleoenvironmental context to enhance the interpretation of the Chuckwalla Valley portion of the Pacific to Rio Grande Trails Landscape. The research design for the study shall make use, at a minimum, of the available peer-reviewed and proprietary Quaternary science literatures, recent Quaternary research conducted in conjunction with the licensing and construction of the Genesis Solar Energy Project, the geoarchaeological research done in conjunction with the licensing and amendment processes for the amended project, new packrat midden analyses, and new Palen Dry Lake sediment core data.

The project owner shall provide for Native American involvement in the design and execution of the fieldwork for these surveys, and in the interpretation and presentation of the results of the surveys.

The project owner shall conclude the paleoenvironmental study effort with the preparation and submission of a comprehensive technical report.

Petroglyph Study

The project owner shall develop, conduct, and submit a technical report of a petroglyph study germane to the period of significance for the Chuckwalla Valley portion of the PRGTL. The purpose of this study is to provide for the integration of the numerous petroglyph sites within the PAA in one comprehensive study. The research design should incorporate recent studies conducted at the behest of Southern California Edison for mitigation related to the siting and construction of

the Red Bluff substation's impacts to the North Chuckwalla Mountains Petroglyph District. Complete photo/GIS inventories of individual petroglyph motifs and of articulated motif panels shall be completed for Dragon Wash, Corn Springs, Chuckwalla Springs and McCoy Springs. In addition a reasonable sampling of the various smaller and disparate petroglyph motifs and panels throughout the Valley shall be inventoried. These disparate petroglyph sites can be ascertained from the list of known sites in the PAA that staff has collected as part of their independent analysis and from any newly discovered petroglyph sites located in conducting field inventories required above. Petroglyph data shall then be analyzed spatially to discern trends at a micro-site scale and at a macroscale across the Valley with other petroglyph sites and other cultural resources that contribute to the Chuckwalla portion of the PRGTL. A research design shall also propose targeted dating techniques (eg., patina analysis), including super-impositioning analysis on a relevant subset of the sites in the Chuckwalla Valley.

The project owner shall provide for Native American involvement in the design and execution of the fieldwork for these surveys, and in the interpretation and presentation of the results of the surveys.

The project owner shall conclude the efforts to inventory, document and analyze the above contributing elements of the PRGTL with the preparation and submission of one or multiple, comprehensive technical report(s).

Revision of Prehistoric Trails Network Cultural Landscape Context (PTNCL) and Field Manual

The project owner shall contribute to a special fund set up by the Energy Commission, an amount sufficient to finance the revision of the extant draft context for the Prehistoric Trails Network Cultural Landscape (PTNCL) and the PTNCL's draft companion field manual. The revision shall recast the subject context to more explicitly consider the trail routes in Chuckwalla Valley, and the cultural resources which are thematic constituents of those routes, as elements that may contribute to the historical significance of the Pacific to Rio Grande Trails Landscape. The final technical reports for the class II surveys of the mountain and mesquite resource areas, the paleoenvironmental study, and the petroglyph study shall inform the context revision.

Public Outreach

The project owner shall fund the production and distribution of video or web-based content the purpose of which is to interpret the Chuckwalla Valley portion of the PRGTL for the general public. The interpretive perspectives that are to inform said content shall derive from academe

as well as from the Native American communities who ascribe heritage values to the valley.

The project owner shall fund initiatives the purposes of which are to directly, albeit partially, compensate Native American communities who ascribe heritage values to Chuckwalla Valley and, more specifically, to the broader PRGTL for PSEGS' degradation of the associative and emic ethnographic values of their ancestral homelands.

Treatment for Cumulative Effects

The project owner shall contribute to a special fund to be comprised of multiple owners of cumulative project contributors, set up by the Energy Commission ~~and/or BLM~~ to help finance the completion of the ~~PTNCL~~ **documentation** ~~and Possible NRHP Nomination~~ program **for the Chuckwalla Valley portion of the PRGTL** ~~presented in the Palen Solar Electric Generating System (PSEGS) Revised Staff Assessment (RSA)~~.

The amount of the contribution shall be $35 per acre that the project encloses or otherwise disturbs. Any additional contingency contribution is not to exceed an amount totaling 20 percent of the original contribution. The contribution to the special fund may be made in installments at the approval of the CPM, with the first installment to constitute one-third of the total original contribution amount.

If a project is not certified, or if a project owner does not build the project, or, if for some other reason deemed acceptable by the CPM, a project owner does not participate in funding the PRGTL documentation ~~and possible NRHP nomination~~ program, the other project owner(s) may consult with the CPM to adjust the scale of the PRGTL documentation ~~and possible NRHP nomination~~ program research activities to match available funding. A project owner that funds the PRGTL documentation ~~and possible NRHP nomination~~ program, then withdraws, will be able to reclaim their monetary contribution, to be refunded on a prorated basis.

Verification:

Treatment for Direct Visual Effects

Field Inventory and Documentation of PRGTL Contributing Elements

1. **Within 90 days of the start of ground disturbance, the project owner shall submit, for the review and approval of the CPM, separate draft research designs for reconnaissance pedestrian (class II) surveys of the Palen, Coxcomb, Eagle, Chuckwalla, and McCoy Mountains Resource Areas, the Coxcomb Fringe and Raceway Mesquite Areas, and the BLM's Palen Dry Lake ACEC. The research designs may be developed as a single document, multiple separate documents, or in any combination convenient to the project owner. Whether prepared separately or as one or several bundles,**

the research designs shall be explicit about the methods to be used in the survey of each area and the anticipated routes of the pedestrian transects through each area.

2. **Prior to the project owner's submission of any one draft technical report of the results of the class II pedestrian survey of any one of the areas in verification 1, above, or of any combination of multiple areas, the project owner shall first submit, for the review and approval of the CPM, California State Parks DPR 523 Series form sets, complete per California State Parks instructions (CA State Parks 1995) and in accordance with the language of this condition of certification.**

3. **Upon the approval of the CPM, the project owner shall, within 14 days of said approval, formally submit each approved DPR 523 Series form set for each cultural resource to the Eastern Information Center of the California Historical Resources Information System and to the BLM's Palm Springs-South Coast Field Office.**

4. **Within 120 days of the CPM's approval of any research design for any of the areas in verification 1, above, the project owner shall submit, for the review and approval of the CPM, a draft technical report of the results of the class II pedestrian survey for each such area. Draft technical reports for the subject areas may be developed separately or in any combination convenient to the project owner.**

5. **Upon the approval of the CPM, the project owner shall, within 14 days of said approval, formally submit each approved technical report of the results of each class II pedestrian survey to the Eastern Information Center of the California Historical Resources Information System and to the BLM's Palm Springs-South Coast Field Office.**

6. **Should the project owner petition to suspend or terminate the license for the subject facility subsequent to the execution of any fieldwork that had been done in partial fulfillment of this condition, yet prior to the submission of draft DPR 523 Series form sets or draft technical reports, the project owner shall, no later than 90 days prior to filing a petition to suspend or terminate said license, submit complete draft form sets for each field-observed cultural resource to the CPM, the Eastern Information Center of the California Historical Resources Information System, and the BLM's Palm Springs-South Coast Field Office, and further submit, to the CPM and the BLM's Palm Springs-South Coast Field Office, organized and legible copies of all of the field documentation for the surveys that have been completed by that time and the drafts, however incomplete, of any technical reports in preparation.**

Paleoenvironmental Study

7. **Within 90 days of the start of ground disturbance, the project owner shall submit, for the review and approval of the CPM and in accordance with CUL-1, a draft research design for a paleoenvironmental study of the Chuckwalla Valley portion of the Pacific to Rio Grande Trails Landscape. The draft research design shall be explicit about the sources of the data and the analytic methods that would be used to inform the study.**

8. **Within 180 days of the CPM's approval of the research design for the subject Chuckwalla Valley paleoenvironmental study, the project owner shall submit, for the review and approval of the CPM, a draft technical report of the results of that study.**

Petroglyph Study

9. **Within 90 days of the start of ground disturbance, the project owner shall submit, for the review and approval of the CPM and in accordance with CUL-1, a draft research design for a petroglyph study of the Chuckwalla Valley portion of the Pacific to Rio Grande Trails Landscape. The draft research design shall be explicit about the sources of the data and the analytic methods that would be used to inform the study.**

10. **Within 180 days of the CPM's approval of the research design for the subject Chuckwalla Valley petroglyph study, the project owner shall submit, for the review and approval of the CPM, a draft technical report of the results of that study.**

Revision of Prehistoric Trails Network Cultural Landscape Context

11. **Within 30 days of the start of ground disturbance, the project owner shall make a contribution to a special fund set up by the Energy Commission the purpose of which would be to completely finance the revision of the extant draft context for the Prehistoric Trails Network Cultural Landscape (PTNCL) and the PTNCL's draft companion field manual.**

Public Outreach

12. **Within 180 days of the finalization of all research related to the mitigation of the Palen Solar Energy Generating System project's effects on cultural resources, the project owner shall facilitate the convention of a steering committee that shall represent the interests of academe, Native American stakeholders, and State and Federal agency regulatory interests in the production and distribution of video or web-based content the purpose of which is to interpret the Chuckwalla Valley portion of the PRGTL for the general public. Major goals of the steering committee will be to frame the content to be produced, select the medium for the content's distribution, and select a contractor to deliver draft and final products. The steering committee will accomplish this goal through the development and release of a request for**

proposals, and the review and selection of the actual contractor. The selection of the contractor will occur within 90 days of the date of the convention of the steering committee.

13. The project owner shall bear the complete cost of all expenses associated with the production and distribution of the subject video or web-based content. Such costs shall include, but shall not be limited to, the convention of the steering committee and all subsequent steering committee meetings, the contractor selection process, and all work associated with the production and release of said content. The project owner shall also bear all travel and per diem expenses for steering committee members and for the contractor, as such costs are made part of the project owner's ultimate contract with that party.

14. Within 180 days of the finalization of all research related to the mitigation of the Palen Solar Energy Generating System project's effects on cultural resources, the project owner shall facilitate the convention of a steering committee that shall represent the interests of Native American stakeholders and include the participatory facilitation of State and Federal agency staff in the development of compensatory initiatives for Native American communities who ascribe heritage values to Chuckwalla Valley. The major goal of the steering committee will be to develop and select the suite of initiatives to be funded The selection of the initiatives will occur within 270 days of the date of the convention of the steering committee.

15. The project owner shall bear the complete cost of all expenses associated with the development of compensatory initiatives for Native American communities who ascribe heritage values to Chuckwalla Valley. Such costs shall include, but shall not be limited to, the convention of the steering committee and all subsequent steering committee meetings, and all work associated with the implementation of said initiatives. The project owner shall also bear all travel and per diem expenses for steering committee members and for any contractors, as such costs are made parts of the project owner's ultimate contracts with those parties.

Treatment for Cumulative Effects

16. No later than 10 days after receiving notice of the successful transfer of funds for any installment to the Energy Commission's ~~and/or BLM's~~ special PTNCL fund, the project owner shall submit a copy of the notice to the Energy Commission's Compliance Project Manager (CPM).

CUL-2 TREATMENT OF DESERT TRAINING CENTER CALIFORNIA-ARIZONA MANEUVER AREA CULTURAL LANDSCAPE (DTCCL) ~~DOCUMENTATION AND POSSIBLE NRHP NOMINATION~~

The project owner shall contribute to a special fund set up by the Energy Commission and/or BLM to finance the completion of the **documentation**

~~and Possible NRHP Nomination~~ program **for the Desert Training Center California-Arizona Maneuver Area Cultural Landscape (DTCCL).** ~~presented in the PSEGS RSA~~.

The amount of the contribution shall be $25 per acre that the project encloses or otherwise disturbs. Any additional contingency contribution is not to exceed an amount totaling 20 percent of the original contribution. The contribution to the special fund may be made in installments at the approval of the CPM, with the first installment to constitute one-third of the total original contribution amount.

If a project is not certified, or if a project owner does not build the project, or, if for some other reason deemed acceptable by the CPM, a project owner does not participate in funding the DTCCL documentation ~~and possible NRHP nomination~~ program, the other project owner(s) may consult with the CPM to adjust the scale of the DTCCL documentation ~~and possible NRHP nomination~~ program research activities to match available funding. A project owner that funds the DTCCL documentation ~~and possible NRHP nomination~~ program, then withdraws, will be able to reclaim their monetary contribution, to be refunded on a prorated basis.

Verification:

1. No later than 10 days after receiving notice of the successful transfer of funds for any installment to the Energy Commission's ~~and/or BLM's~~ special DTCCL fund, the project owner shall submit a copy of the notice to the Energy Commission's Compliance Project Manager (CPM).

CUL-3 CULTURAL RESOURCES PERSONNEL

Prior to the start of ground disturbance (includes "preconstruction site mobilization," "construction-related ground disturbance," and "construction-related grading, boring, and trenching," as defined in the General Conditions for this project), the project owner shall obtain the services of a Cultural Resources Specialist (CRS) and one or more alternate CRSs, if alternates are needed. The CRS shall manage all monitoring, mitigation, curation, and reporting activities in accordance with the Conditions of Certification (Conditions).

The CRS shall have a primarily administrative and coordination role for the **PSEGS**~~PSPP~~. The CRS may obtain the services of Cultural Resources Monitors (CRMs), if needed, to assist in monitoring, mitigation, and curation activities. The project owner shall ensure that the CRS implements the **Cultural Resources** Conditions providing for data recovery from known historical resources and ensure that the CRS makes recommendations regarding the eligibility for listing in the California Register of Historical Resources (CRHR) of any cultural resources that are newly discovered or that may be affected in an unanticipated manner. No ground disturbance shall occur prior to Compliance Project Manager (CPM) approval of the CRS

and alternates, unless such activities are specifically approved by the CPM. Approval of a CRS may be denied or revoked for reasons including but not limited to noncompliance on this or other Energy Commission projects.

Cultural Resources Specialist

The resumés for the CRS and alternate(s) shall include information demonstrating to the satisfaction of the CPM that their training and backgrounds conform to the U.S. Secretary of Interior's Professional Qualifications Standards, as published in Title 36, Code of Federal Regulations, part 61. In addition, the CRS shall have the following qualifications:

1 A background in anthropology and prehistoric archaeology;

2 At least 10 years of archaeological resource mitigation and field experience, with at least three of those years in California; and

3 At least three years of experience in a decision-making capacity on cultural resources projects, with at least one of those years in California, and the appropriate training and experience to knowledgably make recommendations regarding the significance of cultural resources.

Required Cultural Resources Technical Specialists

The project owner shall ensure that the CRS obtains the services of a qualified prehistoric archaeologist to conduct the research specified in **CUL-11** and **CUL-12**. The Project Prehistoric Archaeologist's (PPA) training and background must meet the U.S. Secretary of the Interior's Professional Qualifications Standards for prehistoric archaeology, as published in Title 36, Code of Federal Regulations, part 61, and the résumé of the PPA must demonstrate familiarity with similar artifacts and environmental modifications (deliberate and incidental) to those associated with the prehistoric and protohistoric use of the Chuckwalla Valley. The PPA must meet OSHA standards as a "Competent Person" in trench safety.

The project owner shall ensure that the CRS obtains the services of a qualified historical archaeologist to conduct the research specified in **CUL-13** and **CUL-14**. The Project Historical Archaeologist's (PHA) training and background must meet the U.S. Secretary of Interior's Professional Qualifications Standards for historical archaeology, as published in Title 36, Code of Federal Regulations, part 61.

The résumés of the CRS, alternate CRS, the PPA, and the PHA shall include the names and telephone numbers of contacts familiar with the work of these persons on projects referenced in the résumés and demonstrate to the satisfaction of the CPM that these persons have the appropriate training and experience to undertake the required research. The project owner may name and hire the CRS, alternate CRS, the PPA, and the PHA prior to certification.

Field Crew Members and Cultural Resources Monitors

CRMs and field crew members shall have the following qualifications:

1. A B.S. or B.A. degree in anthropology, archaeology, historical archaeology, or a related field, and one year experience monitoring in California; or

2. An A.S. or A.A. degree in anthropology, archaeology, historical archaeology, or a related field, and four years experience monitoring in California; or

3. Enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historical archaeology, or a related field, and two years of monitoring experience in California.

Verification:

1. Preferably at least 120 days, but in any event no less than 75 days prior to the start of ground disturbance, the project owner shall submit the résumés for the CRS, the alternate CRS(s) if desired, the PPA, and the PHA to the CPM for review and approval.

2. At least 65 days prior to the start of data recovery on known archaeological sites, the project owner shall confirm in writing to the CPM that the approved CRS, the PPA, and the PHA will be available for on-site work and are prepared to implement the **Cultural Resources** Conditions **CUL-11** through **CUL-15**.

3. At least 10 days prior to a termination or release of the CRS, or within 10 days after the resignation of a CRS, the project owner shall submit the résumé of the proposed new CRS to the CPM for review and approval. At the same time, the project owner shall also provide to the proposed new CRS the AFC and all cultural resources documents, field notes, photographs, and other cultural resources materials generated by the project. If no alternate CRS is available to assume the duties of the CRS, a monitor may serve in place of a CRS so that ground disturbance may continue up to a maximum of three days without a CRS. If cultural resources are discovered then ground disturbance will remain halted until there is a CRS or alternate CRS to make a recommendation regarding significance.

4. At least 20 days prior to data recovery on known archaeological sites, the CRS shall provide a letter naming anticipated field crew members for the project and attesting that the identified field crew members meet the minimum qualifications for cultural resources data recovery required by this Condition.

5. At least 20 days prior to ground disturbance, the CRS shall provide a letter naming anticipated CRMs for the project and attesting that the identified CRMs meet the minimum qualifications for cultural resources monitoring required by this Condition.

6. At least five days prior to additional CRMs beginning on-site duties during the project, the CRS shall provide letters to the CPM identifying the new CRMs and

attesting to their qualifications.

CUL-4 PROJECT DOCUMENTATION FOR CULTURAL RESOURCES PERSONNEL

Prior to the start of ground disturbance, the project owner shall provide the CRS, the PPA, and the PHA with copies of the AFC, data responses, confidential cultural resources documents, the ~~Revised~~ **Final** Staff Assessment (~~RSA~~**FSA**~~, RSA Errata,~~ and the Commission Decision for the project. The project owner shall also provide the CRS, the PPA, the PHA, and the CPM with maps and drawings showing the footprints of the power plant, all linear facility routes, all access roads, and all laydown areas. Maps shall include the appropriate USGS quadrangles and maps at an appropriate scale (e.g., 1:2400 or 1" = 200') for plotting cultural features or materials. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the CRS and CPM. The CPM shall review map submittals and, in consultation with the CRS, approve those that are appropriate for use in cultural resources planning activities. No ground disturbance shall occur prior to CPM approval of maps and drawings, unless such activities are specifically approved by the CPM.

If construction of the project would proceed in phases, maps and drawings not previously provided shall be provided to the CRS, the PPA, the PHA, and CPM prior to the start of each phase. Written notice identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.

Weekly, until ground disturbance is completed, the project construction manager shall provide to the CRS and CPM a schedule of project activities for the following week, including the identification of area(s) where ground disturbance will occur during that week.

The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases.

Verification:

1. Preferably at least 115 days, but in any event no less than 60 days prior to the start of ground disturbance, the project owner shall provide the AFC, data responses, confidential cultural resources documents, the **Final Staff Assessment (FSA**)~~Revised Staff Assessment (RSA), RSA Errata,~~ and the Commission Decision for the project to the CRS, if needed, and to the PPA, and the PHA. The project owner shall also provide the subject maps and drawings to the CRS, PPA, PHA, and CPM. Staff, in consultation with the CRS, PPA, and PHA, will review and approve maps and drawings suitable for cultural resources monitoring and data recovery activities.

2. At least 15 days prior to the start of ground disturbance, if there are changes to any project-related footprint, the project owner shall provide revised maps and drawings for the changes to the CRS, PPA, PHA, and CPM.

3. At least 15 days prior to the start of each phase of a phased project, the project owner shall submit the appropriate maps and drawings, if not previously provided, to the CRS, PPA, PHA, and CPM.

4. Weekly, during ground disturbance, a current schedule of anticipated project activity shall be provided to the CRS and CPM by letter, e-mail, or fax.

5. Within five days of changing the scheduling of phases of a phased project, the project owner shall provide written notice of the changes to the CRS and CPM.

CUL-5 CULTURAL RESOURCES MONITORING AND MITIGATION PLAN

Prior to the start of ground disturbance, the project owner shall submit to the CPM for review and approval the Cultural Resources Monitoring and Mitigation Plan (CRMMP), as prepared by or under the direction of the CRS, with the contributions of the PPA, and the PHA. The authors' name(s) shall appear on the title page of the CRMMP. The CRMMP shall specify the impact mitigation protocols for all known cultural resources**, i.e., archaeological, ethnographic, and historic resources,** and identify general and specific measures to minimize potential impacts to all other cultural resources, including those discovered during construction. Implementation of the CRMMP shall be the responsibility of the CRS and the project owner. Copies of the CRMMP shall reside with the CRS, alternate CRS, the PPA, and the PHA, each CRM, and the project owner's on-site construction manager. No ground disturbance shall occur prior to CPM approval of the CRMMP, unless such activities are specifically approved by the CPM. Prior to certification, the project owner may have the CRS, alternate CRS, the PPA, and the PHA complete and submit to CEC for review the CRMMP, except for the portions to be contributed by the PTNCL and the DTCCL programs.

The CRMMP shall include, but not be limited to, the elements and measures listed below.

1. The following statement shall be included in the Introduction: "Any discussion, summary, or paraphrasing of the Conditions of Certification in this CRMMP is intended as general guidance and as an aid to the user in understanding the Conditions and their implementation. The Conditions, as written in the Commission Decision, shall supersede any summarization, description, or interpretation of the conditions in the CRMMP. The **Cultural Resources** Conditions of Certification from the Commission Decision are contained in **Appendix A**."

2. The duties of the CRS shall be fully discussed, including coordination duties with respect to the completion of the Prehistoric Trails Network Cultural Landscape (PTNCL) documentation ~~and possible NRHP nomination~~ program and the Desert Training Center California-Arizona Maneuver Area Cultural Landscape (DTCCL) documentation ~~and possible NRHP nomination~~ program, and oversight/management duties with

respect to site evaluation, data collection, monitoring, and reporting at both known prehistoric and historic-period archaeological sites and any CRHR-eligible (as determined by the CPM) prehistoric and historic-period archaeological sites discovered during construction.

3. A general research design shall be developed that:

   a. Charts a timeline of all research activities, including those coordinated under the PTNCL and DTCCL documentation ~~and possible NRHP nomination~~ program~~s~~;

   b. Recapitulates the existing paleoenvironmental, prehistoric, ethnohistoric, ethnographic, and historic contexts developed in the PTNCL and DTCCL historic context and adds to these the additional context of the non-military, historic-period occupation and use of the Chuckwalla Valley, to create a comprehensive historic context for the **PSEGS** ~~PSPP~~ vicinity;

   c. Poses archaeological research questions and testable hypotheses specifically applicable to the archaeological resource types known for the Chuckwalla Valley, based on the research questions developed under the PTNCL and DTCCL research and on the archaeological and historical literature pertinent to the Chuckwalla Valley; and

   d. Clearly articulates why it is in the public interest to address the research questions that it poses.

4. Protocols, reflecting the guidance provided in **CUL-10** through **CUL-15** shall be specified for the treatment of known and newly discovered prehistoric and historic-period archaeological resource types.

5. Artifact collection, retention/disposal, and curation policies shall be discussed, as related to the research questions formulated in the research design. These policies shall apply to cultural resources materials and documentation resulting from evaluation and data recovery at ~~both~~ known prehistoric**-period, ethnographic,** and historic-period archaeological sites and any CRHR-eligible (as determined by the CPM) prehistoric and historic-period archaeological sites discovered during construction. A prescriptive treatment plan may be included in the CRMMP for limited data types.

6. The implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the ground-disturbance and post-ground–disturbance analysis phases of the project shall be specified.

7. Person(s) expected to perform each of the tasks, their responsibilities, and the reporting relationships between project construction management and the mitigation and monitoring team shall be identified.

8. The manner in which Native American observers or monitors will be included, in addition to their roles in the activities required under **CUL-1**, the procedures to be used to select them, and their roles and responsibilities shall be described.

9. All impact-avoidance measures (such as flagging or fencing) to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during ground disturbance, construction, and/or operation shall be described. Any areas where these measures are to be implemented shall be identified. The description shall address how these measures would be implemented prior to the start of ground disturbance and how long they would be needed to protect the resources from project-related impacts.

10. The commitment to record on Department of Parks and Recreation (DPR) 523 **Series** forms, to map, and to photograph all encountered cultural resources over 50 years of age shall be stated. In addition, the commitment to curate all archaeological materials retained as a result of the archaeological investigations (survey, testing, **and** data recovery), in accordance with the California State Historical Resources Commission's Guidelines for the Curation of Archaeological Collections, into a retrievable storage collection in a public repository or museum shall be stated.

11. The commitment of the project owner to pay all curation fees for artifacts recovered and for related documentation produced during cultural resources investigations conducted for the project shall be stated. The project owner shall identify a curation facility that could accept cultural resources materials resulting from **PSEGS**~~PSPP~~ cultural resources investigations.

12. The CRS shall attest to having access to equipment and supplies necessary for site mapping, photography, and recovery of all cultural resource materials (that cannot be treated prescriptively) from known CRHR-eligible archaeological sites and from CRHR-eligible sites that are encountered during ground disturbance .

13. The contents, format, and review and approval process of the final Cultural Resource Report (CRR) shall be described.

Verification:

1. Preferably at least 45 days, but in any event no less than 30 days prior to the start of ground disturbance, the project owner shall submit the CRMMP to the CPM for review and approval.

2. At least 20 days prior to the start of ground disturbance, in a letter to the CPM, the project owner shall agree to pay curation fees for any materials generated or collected as a result of the archaeological investigations (survey, testing, **and** data recovery).

3. At least 30 days prior to the start of ground disturbance, the project owner shall provide to the CPM a copy of a letter from a curation facility that meets the standards stated in the California State Historical Resources Commission's Guidelines for the Curation of Archaeological Collections, stating the facility's willingness and ability to receive the materials generated by **PSEGS**~~PSPP~~ cultural resources activities and requiring curation. Any agreements concerning curation will be retained and available for audit for the life of the project.

CUL-6 CULTURAL RESOURCES REPORT (CRR)

The project owner shall submit the final Cultural Resources Report (CRR) to the CPM for review and approval and to the BLM Palm Springs archaeologist for review and comment. The final CRR shall be written by or under the direction of the CRS. The final CRR shall report on all field activities including dates, times and locations, results, samplings, and analyses. All survey reports, revised and final Department of Parks and Recreation (DPR) 523 forms, data recovery reports, and any additional research reports not previously submitted to the California Historical Resource Information System (CHRIS) and the State Historic Preservation Officer (SHPO) shall be included as appendices to the final CRR.

If the project owner requests a suspension of ground disturbance and/or construction activities, then a draft CRR that covers all cultural resources activities associated with the project shall be prepared by the CRS and submitted to the CPM and to the BLM Palm Springs archaeologist for review and approval on the same day as the suspension/extension request. The draft CRR shall be retained at the project site in a secure facility until ground disturbance and/or construction resumes or the project is withdrawn. If the project is withdrawn, then a final CRR shall be submitted to the CPM for review and approval at the same time as the withdrawal request.

Verification:

1. Within 30 days after requesting a suspension of construction activities, the project owner shall submit a draft CRR to the CPM for review and approval.

2. Within 180 days after completion of ground disturbance (including landscaping), the project owner shall submit the final CRR to the CPM for review and approval and to the BLM Palm Springs archaeologist for review and comment. If any reports have previously been sent to the CHRIS, then receipt letters from the CHRIS or other verification of receipt shall be included in an appendix.

3. Within 10 days after the CPM and the BLM Palm Springs archaeologist approve the CRR, the project owner shall provide documentation to the CPM confirming that copies of the final CRR have been provided to the SHPO, the CHRIS, the curating institution, if archaeological materials were collected, and to the tribal chairpersons of any Native American tribes requesting copies of project-related reports.

CUL-7 WORKER ENVIRONMENTAL AWARENESS PROGRAM (WEAP)

Prior to and for the duration of ground disturbance, the project owner shall provide Worker Environmental Awareness Program (WEAP) training to all new workers within their first week of employment at the project site, along the linear facilities routes, and at laydown areas, roads, and other ancillary areas. The training shall be prepared by the CRS, may be conducted by any member of the archaeological team, and may be presented in the form of a video. The CRS shall be available (by telephone or in person) to answer questions posed by employees. The training may be discontinued when ground disturbance is completed or suspended, but must be resumed when ground disturbance, such as landscaping, resumes.

The training shall include:

1. A discussion of applicable laws and penalties under the law;

2. Samples or visuals of artifacts that might be found in the project vicinity;

3. A discussion of what such artifacts may look like when partially buried, or wholly buried and then freshly exposed;

4. A discussion of what prehistoric and historical archaeological deposits look like at the surface and when exposed during construction, and the range of variation in the appearance of such deposits;

5. Instruction that the CRS, alternate CRS, and CRMs have the authority to halt ground disturbance in the area of a discovery to an extent sufficient to ensure that the resource is protected from further impacts, as determined by the CRS;

6. Instruction that employees are to halt work on their own in the vicinity of a potential cultural resources discovery and shall contact their supervisor and the CRS or CRM, and that redirection of work would be determined by the construction supervisor and the CRS;

7. An informational brochure that identifies reporting procedures in the event of a discovery;

8. An acknowledgement form signed by each worker indicating that they have received the training; and

9. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

10. No ground disturbance shall occur prior to implementation of the WEAP program, unless such activities are specifically approved by the CPM.

Verification:

1. At least 30 days prior to the start of ground disturbance, the CRS shall provide the training program draft text and graphics and the informational brochure to the CPM for review and approval.

2. At least 15 days prior to the start of ground disturbance, the CPM will provide to the project owner a WEAP Training Acknowledgement form for each WEAP trained worker to sign.

3. Monthly, until ground disturbance is completed, the project owner shall provide in the Monthly Compliance Report (MCR) the WEAP Training Acknowledgement forms of workers who have completed the training in the prior month and a running total of all persons who have completed training to date.

CUL-8 CONSTRUCTION MONITORING PROGRAM

~~The project owner shall ensure that the CRS, alternate CRS, or CRMs, to prevent construction impacts to undiscovered resources and to ensure that known resources are not impacted in an unanticipated manner, monitor full time all ground disturbance.~~

~~Full-time archaeological monitoring for this project shall be the archaeological monitoring of the earth-removing activities in the areas specified in the previous paragraph, for as long as the activities are ongoing. Where excavation equipment is actively removing dirt and hauling the excavated material farther than 50 feet from the location of active excavation, full-time archaeological monitoring shall require at least two monitors per excavation area. In this circumstance, one monitor shall observe the location of active excavation and a second monitor shall inspect the dumped material. For excavation areas where the excavated material is dumped no farther than 50 feet from the location of active excavation, one monitor shall both observe the location of active excavation and inspect the dumped material.~~

~~A Native American monitor shall be obtained to monitor ground disturbance in areas where Native American artifacts may be discovered. Contact lists of interested Native Americans and guidelines for monitoring shall be obtained from the Native American Heritage Commission. Preference in selecting a monitor shall be given to Native Americans with traditional ties to the area that shall be monitored. If efforts to obtain the services of a qualified Native American monitor are unsuccessful, the project owner shall immediately inform the CPM. The CPM will either identify potential monitors or will allow ground disturbance to proceed without a Native American monitor.~~

~~The research design in the CRMMP shall govern the collection, treatment, retention/disposal, and curation of any archaeological materials encountered.~~

On forms provided by the CPM, CRMs shall keep a daily log of any monitoring and other cultural resources activities and any instances of noncompliance with the Conditions and/or applicable LORS. Copies of the daily monitoring logs shall be provided by the CRS to the CPM, if requested by the CPM. From these logs, the CRS shall compile a monthly monitoring summary report to be included in the MCR. If there are no monitoring activities, the summary report shall specify why monitoring has been suspended.

The CRS or alternate CRS shall report daily to the CPM on the status of the project's cultural resources-related activities, unless reducing or ending daily reporting is requested by the CRS and approved by the CPM.

In the event that the CRS believes that the current level of monitoring is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the level of monitoring shall be provided to the CPM for review and approval prior to any change in the level of monitoring. The CRS, at his or her discretion, or at the request of the CPM, may informally discuss cultural resources monitoring and mitigation activities with Energy Commission technical staff.

Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS, or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these Conditions.

Upon becoming aware of any incidents of non-compliance with the Conditions and/or applicable LORS, the CRS and/or the project owner shall notify the CPM by telephone or e-mail within 24 hours. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the Conditions. When the issue is resolved, the CRS shall write a report describing the issue, the resolution of the issue, and the effectiveness of the resolution measures. This report shall be provided in the next MCR for the review of the CPM.

Verification:

1. At least 30 days prior to the start of ground disturbance, the CPM will provide to the CRS an electronic copy of a form to be used as a daily monitoring log.

2. Monthly, while monitoring is on-going, the project owner shall include in each MCR a copy of the monthly summary report of cultural resources-related monitoring prepared by the CRS and shall attach any new DPR 523A forms completed for finds treated prescriptively, as specified in the CRMMP.

~~3. At least 24 hours prior to implementing a proposed change in monitoring level, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for changing the monitoring level.~~

~~4. Daily, as long as no cultural resources are found, the CRS shall provide a statement that "no cultural resources over 50 years of age were discovered" to the CPM as an e-mail or in some other form of communication acceptable to the CPM.~~

~~5. At least 24 hours prior to reducing or ending daily reporting, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for reducing or ending daily reporting.~~

~~6. No later than 30 days following the discovery of any Native American cultural materials, the project owner shall submit to the CPM copies of the information transmittal letters sent to the Chairpersons of the Native American tribes or groups who requested the information. Additionally, the project owner shall submit to the CPM copies of letters of transmittal for all subsequent responses to Native American requests for notification, consultation, and reports and records.~~

~~7. Within 15 days of receiving them, the project owner shall submit to the CPM copies of any comments or information provided by Native Americans in response to the project owner's transmittals of information.~~

Prior to the start of construction-related ground disturbance or grading, boring, and trenching, as defined in the General Conditions for this project; or surface grading or subsurface soil work during pre-construction activities or site mobilization; or mowing activities and heavy equipment use in loose or sandy soils, at the project site, access roads, and linear facilities including environmental exclusion fencing along roadways, the project owner shall notify the CPM and all interested Native Americans of the date on which ground disturbance will ensue.

The project owner shall ensure that the CRS, alternate CRS, or CRMs monitor, full, time all of the ~~above~~ following **specified ground disturbance at the project site**~~,~~: 1) surface grading or subsurface soil work during pre-construction activities, and site mobilization; 2) mowing activities and heavy equipment use in undisturbed loose or sandy soils defined as Zone 2 or Zone 3 of the sand transport corridor; 3) excavation and grading of the power block and common facilities areas; 4) excavation of trenches; and 5) grading of the access, perimeter, and spoke roads **along the linear facilities routes, and at laydown areas, roads, and other ancillary areas, to ensure there are no impacts to undiscovered cultural resources and to ensure that known cultural resources are not affected in an unanticipated manner.**

Full-time archaeological monitoring for this project shall be the archaeological monitoring of the ground-disturbing activities specified in the previous paragraph, for as long as the activities are ongoing. Where excavation equipment is actively removing dirt and hauling the excavated material farther than 50 feet from the location of active excavation, full-time archaeological monitoring shall require at least two monitors per excavation area. In this circumstance, one monitor shall observe the location of active excavation and a second monitor shall inspect the dumped material. For excavation areas where the excavated material is dumped no farther than 50 feet from the location of active excavation, one monitor shall both observe the location of active excavation and inspect the dumped material.

In the event that the CRS believes that the required number of monitors is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the number of monitors shall be provided to the CPM for review and approval prior to any change in the number of monitors.

The project owner shall obtain the services of one or more Native American Monitors (NAM) to monitor construction-related ground disturbance in areas where Native American artifacts may be discovered. Contact lists of interested Native Americans and guidelines for monitoring shall be obtained from the NAHC. Preference in selecting an NAM shall be given to Native Americans with traditional ties to the area that shall be monitored. If efforts to obtain the services of a qualified NAM are unsuccessful, the project owner shall immediately inform the CPM. The CPM will either identify potential monitors or will allow construction-related ground disturbance to proceed without an NAM.

The research design in the CRMMP shall govern the collection, treatment, retention/disposal, and curation of any archaeological materials encountered. On forms provided by the CPM, CRMs shall keep a daily log of any monitoring and other cultural resources activities and any instances of non-compliance with the Conditions and/or applicable LORS. The daily monitoring logs shall at a minimum include the following:

- **First and last name of the CRM and any accompanying NAM.**
- **Time in and out.**
- **Weather. Specify if weather conditions led to work stoppages.**
- **Work location (project component). Provide specifics—.e.g., transmission ROW, solar unit A, power block.**

- **Proximity to site location. Specify if work conducted within 1000 feet of a known cultural resource.**
- **Work type (machine).**
- **Work crew (company, operator, foreman).**
- **Depth of excavation.**
- **Description of work.**
- **Stratigraphy.**
- **Artifacts, listed with the following identifying features:**
  - **Field artifact #: When recording artifacts in the daily monitoring logs, the CRS shall institute a field numbering system to reduce the likelihood of repeat artifact numbers. A typical numbering system could include a project abbreviation, monitor's initials, and a set of numbers given to that monitor: e.g., HECA-MB-123.**
  - **Description.**
  - **Measurements.**
  - **UTM.**
- **Whether artifacts are likely to be isolates or components of larger resources.**
- **Assessment of significance of any finds.**
- **Actions taken.**
- **Plan for the next work day.**

A cover sheet shall be submitted with each day's monitoring logs, and shall at a minimum include the following:

- **Count and list of first and last names of all CRMs and of all NAMs for that day.**
- **General description (in paragraph form) of that day's overall monitoring efforts, including monitor names and locations.**
- **Any reasons for halting work that day.**
- **Count and list of all artifacts found that day: include artifact #, location (i.e., grading in Unit X), measurements, UTMs, and very brief description (i.e., historic can, granitic biface, quartzite flake).**
- **Whether any artifacts were found out of context (i.e., in fill, caisson drilling, flood debris, spoils pile).**

Copies of the daily monitoring logs and cover sheets shall be provided by email from the CRS to the CPM, as follows:

- **Each day's monitoring logs and cover sheet shall be merged into one PDF document**
- **The PDF title and headings, and emails shall clearly indicate the date of the applicable monitoring logs.**
- **PDFs for any revised or resubmitted versions shall use the word "revised" in the title.**

Daily and/or weekly maps shall be submitted along with the monitoring logs as follows:

- **The CRS shall provide daily and/or weekly maps of artifacts at the request of the CPM. A map shall also be provided if artifact locations show complexity, high density, or other unique considerations.**
- **Maps shall include labeled artifacts, project boundaries, previously recorded sites and isolates, aerial imagery background, and appropriate scales.**

From the daily monitoring logs, the CRS shall compile a monthly monitoring summary report to be included in the MCR. If there are no monitoring activities, the summary report shall specify why monitoring has been suspended.

- **The Cultural Resources section of the MCR shall be prepared in coordination with the CRS, and shall include a monthly summary report of cultural resources-related monitoring. The summary shall:**
  - **List the number of CRMs and NAMs on a daily basis, as well as provide monthly monitoring-day totals.**
  - **Give an overview of cultural resource monitoring work for that month, and discuss any issues that arose.**
  - **Describe fulfillment of requirements of each cultural mitigation measure.**
  - **Summarize the confidential appendix to the MCR, without disclosing any specific confidential details.**
  - **Include the artifact concordance table (as discussed under the next bullet point), but with removal of UTMs.**
- **Each MCR, prepared under supervision of the CRS, shall be accompanied by a confidential appendix that contains completed DPR 523A forms for all artifacts recorded or collected in that month. For any artifact without a corresponding DPR form, the CRS shall specify why the DPR form is not applicable or pending (i.e. as part of a larger site update).**
  - **A concordance table that matches field artifact numbers with the artifact numbers used in the DPR forms shall be included. The**

sortable table shall contain each artifact's date of collection and UTM numbers, and note if an artifact has been deaccessioned or otherwise does not have a corresponding DPR form. Any post-field log recordation changes to artifact numbers shall also be noted.

- **DPR forms shall be submitted as one combined PDF.**
  - **The PDF shall organize DPR forms by site and/or artifact number.**
  - **The PDF shall include an index and bookmarks.**
- **If artifacts from a given site location (in close proximity of each other or an existing site) are collected month after month, and if agreed upon with the CPM, a final updated DPR for the site may be submitted at the completion of monitoring. The monthly concordance table shall note that the DPR form for the included artifacts is pending.**

The CRS or alternate CRS shall report daily to the CPM on the status of the project's cultural resources-related activities, unless reducing or ending daily reporting is requested by the CRS and approved by the CPM.

In the event that the CRS believes that the current level of monitoring is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the level of monitoring shall be provided to the CPM for review and approval prior to any change in the level of monitoring.

The CRS, at his or her discretion, or at the request of the CPM, may informally discuss cultural resources monitoring and mitigation activities with Energy Commission technical staff.

Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS, or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these Conditions.

Upon becoming aware of any incidents of non-compliance with the Conditions and/or applicable LORS, the CRS and/or the project owner shall notify the CPM. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the Conditions. When the issue is resolved, the CRS shall write a report describing the issue, the resolution of the issue, and the effectiveness of the resolution measures. This report shall be provided in the next MCR for the review of the CPM.

Verification:

1. **At least 30 days prior to the start of ground disturbance, the CPM will notify all Native Americans with whom Energy Commission staff communicated during the project review of the date on which the project's ground disturbance will begin.**

2. **At least 30 days prior to the start of ground disturbance, the CPM will provide to the CRS an electronic copy of a form to be used as a daily monitoring log and information to be included in the cover sheet for the daily monitoring logs.**

3. **While monitoring is on-going, the project owner shall submit each day's monitoring logs and cover sheet merged into one PDF document by email within 24 hours.**

4. **The CRS and/or project owner shall notify the CPM of any incidents of non-compliance with the Conditions and/or applicable LORS by telephone or email within 24 hours**

5. **The CRS shall provide daily maps of artifacts along with the daily monitoring logs if more than 10 artifacts are found per day, or as requested by the CPM.**

6. **The CRS shall provide weekly maps of artifacts if ~~there~~more than 50 artifacts are found per week, or as requested by the CPM. The map shall be submitted within two business days after the end of each week.**

7. **Within 15 days of receiving from a local Native American group a request that a NAM be employed, the project owner shall submit a copy of the request and a copy of a response letter to the group notifying them that a NAM has been employed and identifying the NAM.**

8. **Monthly, while monitoring is on-going, the project owner shall submit MCRs and accompanying monthly summary reports. The project owner shall attach any new DPR 523A forms, under confidential cover, completed for finds treated prescriptively, as specified in the CRMMP.**

a. **Final updated DPRs with sites (where artifacts are collected month after month) can be submitted at the completion of monitoring, as agreed upon with the CPM.**

9. **At least 24 hours prior to implementing a proposed change in monitoring level, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for changing the monitoring level.**

10. **At least 24 hours prior to reducing or ending daily reporting, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some**

other form of communication acceptable to the CPM) detailing the CRS's justification for reducing or ending daily reporting.

11. **Within 15 days of receiving them, the project owner shall submit to the CPM copies of any comments or information provided by Native Americans in response to the project owner's transmittals of information.**

CUL-9 AUTHORITY TO HALT CONSTRUCTION; TREATMENT OF DISCOVERIES

The project owner shall grant authority to halt ground disturbance to the CRS, alternate CRS, PPA, PHA, and the CRMs in the event of a discovery. Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor in consultation with the CRS.

In the event that a cultural resource over 50 years of age is found (or if younger, determined exceptionally significant by the CPM), or impacts to such a resource can be anticipated, ground disturbance shall be halted or redirected in the immediate vicinity of the discovery sufficient to ensure that the resource is protected from further impacts. Monitoring and daily reporting, as provided in other Conditions, shall continue during the project's ground-disturbing activities elsewhere. The halting or redirection of ground disturbance shall remain in effect until the CRS has visited the discovery, and all of the following have occurred:

1. The CRS has notified the project owner, and the CPM has been notified within 24 hours of the discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning, including a description of the discovery (or changes in character or attributes), the action taken (i.e., work stoppage or redirection), a recommendation of CRHR eligibility, and recommendations for data recovery from any cultural resources discoveries, whether or not a determination of CRHR eligibility has been made.

2. If the discovery would be of interest to Native Americans, the CRS has notified all Native American groups that expressed a desire to be notified in the event of such a discovery.

3. The CRS has completed field notes, measurements, and photography for a DPR 523 "Primary" form. Unless the find can be treated prescriptively, as specified in the CRMMP, the "Description" entry of the DPR 523 "Primary" form shall include a recommendation on the CRHR eligibility of the discovery. The project owner shall submit completed forms to the CPM.

4. The CRS, the project owner, and the CPM have conferred, and the CPM has concurred with the recommended eligibility of the discovery and approved the CRS's proposed data recovery plan, if any, including the curation of the artifacts, or other appropriate mitigation; and any necessary

data recovery and mitigation have been completed.

Verification:

1. At least 30 days prior to the start of ground disturbance, the project owner shall provide the CPM and CRS with a letter confirming that the CRS, alternate CRS, PPA, PHA, and CRMs have the authority to halt ground disturbance in the vicinity of a cultural resources discovery, and that the project owner shall ensure that the CRS notifies the CPM within 24 hours of a discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning.

2. Within 48 hours of the discovery of a resource of interest to Native Americans, the project owner shall ensure that the CRS notifies all Native American groups that expressed a desire to be notified in the event of such a discovery.

3. Unless the discovery can be treated prescriptively, as specified in the CRMMP, completed DPR 523 forms for resources newly discovered during ground disturbance shall be submitted to the CPM for review and approval no later than 24 hours following the notification of the CPM, or 48 hours following the completion of data recordation/recovery, whichever the CRS decides is more appropriate for the subject cultural resource.

CUL-10 FLAG AND AVOID

If resources within the transmission line corridor can be spanned rather than impacted, or in the event that new resources are discovered during construction where impacts can be reduced or avoided, the project owner shall:

1. Ensure that a CRS, alternate CRS, PPA, or CRM re-establish the boundary of each site, add a 10-meter-wide buffer around the periphery of each site boundary, and flag the resulting space in a conspicuous manner;

2. Ensure that a CRM enforces avoidance of the flagged areas during **PSEGS**~~PSPP~~ construction; and

3. Ensure, after completion of construction, boundary markings around each site and buffer are removed so as not to attract vandals.

Verification: Within 90 days of the completion of Project construction, the project owner shall submit for CPM review and approval a letter, with photographs and maps, evidencing the removal of boundary markings.

CUL-11 DATA RECOVERY FOR SIMPLE PREHISTORIC SITES

(Sparse Lithic Scatters, Cairns, and Pot Drops)

The project owner shall ensure the CRMMP includes a data recovery plan for the resource type “simple prehistoric sites,” consisting of **the** site~~s SMP-P-1015, SMP-P-1016, SMP-P-2014, SMP-P-2015, and~~ SMP-P-MT-001. This

site list may be revised only with the agreement of the CRS and the CPM. The data recovery plan shall include the use of the CARIDAP protocol on sites that qualify, how to proceed if features or other buried deposits are encountered, and the materials analyses and laboratory artifact analyses that will be used.

The plan shall also specify in detail the location recordation equipment and methods used and describe any post-processing of the data. If allowed by the BLM, prior to the start of ground disturbance within 30 meters of the site boundaries of each of these sites, the project owner shall ensure that the CRS, the PPA, and/or archaeological team members implement the plan, which, for sites where CARIDAP does not apply, shall include, but is not limited to the following tasks:

1. Use location recordation equipment that has the latest technology with sub-meter accuracy (such as UTM 11 North or California Teale Albers) to add to the original site maps the following features: seasonal drainages, site boundaries, location of each individual artifact, and the boundaries around individual artifact concentrations;

2. Request the PTNCL PG, or equivalent qualified person approved by the CPM and hired by the project owner should the PTNCL geoarchaeologist not be available, to identify the specific landform for each site and its relationship to specific ancient lakeshores of Palen Dry Lake; if a lakeshore is present within 100 meters of the site boundary, include it on the site map;

3. Map and field-record all lithic artifacts (numbers of flakes, the reduction sequence stage each represents, cores, tool blanks, finished tools, hammerstones, and concentrations, and the material types of each) and the other types of prehistoric artifacts present.

4. Map any differential distribution of artifacts and suggest explanations for the distribution

5. Assess the integrity of the site and provide the evidence substantiating that assessment;

6. Collect for dating and source analyses any obsidian artifacts;

7. Field record the surface location of all other artifacts and collect all ceramic artifacts and botanical and faunal remains for laboratory analysis and curation;

8. Surface scrape to a depth of 5 centimeters a 5-meter-by-5-meter area centered on the artifact concentration, field-record the lithic artifacts as to location, material type, and the reduction sequence stage each represents, record the location of all other artifacts, and retain the obsidian

and ceramic artifacts and botanical and faunal remains for laboratory analysis and curation;

9. Excavate one 1-meter-by-1-meter unit in 10-centimeter levels until the unit reaches a depth of 20 centimeters below any anthropogenic materials, placing the unit in the part of the site with the highest artifact density and recording its locations on the site map;

10. Place one 1-meter-by-1-meter excavation unit, as described above, in the center of each concentration if multiple artifact concentrations have been identified;

11. Notify the CPM by telephone or e-mail that subsurface deposits were or were not encountered and make a recommendation on the site‘s CRHR eligibility;

12. If no subsurface deposits were encountered, and the CPM agrees the site is not eligible for the CRHR, data recovery is complete;

13. If subsurface deposits are encountered, test the horizontal limits of the site by excavating additional 1-meter-by-1-meter excavation units in 10-centimeter levels until the unit reaches a depth of 20 centimeters below any anthropogenic materials, using a shovel or hand auger, or other similar technique, at four spots equally spread around the exterior edge of each site, recording the locations of these units on the site map;

14. Sample the encountered features or deposits, using the methods described in the CRMMP, record their locations on the site map, retain samples, such as flotation, pollen, and charcoal, for analysis, and retain all artifacts for professionally appropriate laboratory analyses and curation, until data recovery is complete;

15. Present the results of the **CUL-11** data recovery in a letter report by the PPA or CRS, which shall serve as a preliminary report. Letter reports may address one site, or multiple sites depending on the needs of the CRS. The letter report shall be a concise document the provides description of the schedule and methods used in the field effort, a preliminary tally of the numbers and types of features and deposits that were found, a discussion of the potential range of error for that tally, a map showing the location of excavation units including topographic contours and the site landforms, and a discussion of the CRHR eligibility of each site and the justification for that determination;

16. Update the existing Department of Parks and Recreation (DPR) 523 site form for these sites, including new data on seasonal drainages, site boundaries, location of each individual artifact, the boundaries around individual artifact concentrations, the landform, and the eligibility determination;

17. Provide the recovered data to the PTNCL PI-Prehistoric Archaeologist; and

18. Present the final results of data recovery at these prehistoric sites in the CRR, as described in **CUL-6**.

Verification:

1. At least 45 days prior to ground disturbance, the project owner shall notify the CPM that data recovery for small sites has ensued.

2. After the completion of the excavation of the first 1-meter-by-1-meter excavation unit at each of the subject sites, the CRS shall notify the CPM regarding the presence or absence of subsurface deposits and shall make a recommendation on the site's CRHR eligibility.

3. Within one week of the completion of data recovery at a site, the project owner shall submit a letter report written by the PPA or CRS for review and approval of the CPM. When the CPM approves the letter report, ground disturbance may begin at this site location.

CUL-12 DATA RECOVERY FOR COMPLEX PREHISTORIC SITES

The project owner shall ensure the CRMMP includes a data recovery plan for the resource type "complex prehistoric sites," consisting of ~~SMP-P-1017, SMP-P-1018,~~ SMP-P-2018~~,~~ and SMP-P-2023. This site list may be revised only with the agreement of the CRS and the CPM. The data recovery plan shall include how to proceed if buried deposits are encountered and shall also include the materials analyses and laboratory artifact analyses that will be used. The plan shall also specify in detail the location recordation equipment and methods used and describe any post-processing of the data. If allowed by the BLM, prior to the start of ground disturbance within 30 meters of the site boundaries of each of these sites, the project owner shall then ensure that the CRS, the PPA, and/or archaeological team members implement the plan, which shall include, but is not limited to, the following tasks:

1. Use location recordation equipment that has the latest technology with sub-meter accuracy (such as UTM 11 North or California Teale Albers) to add to the original site maps the following features: seasonal drainages, site boundaries, location of each individual artifact, and the boundaries around individual artifact concentrations;

2. Request the PTNCL PG, or equivalent qualified person approved by the CPM and hired by the project owner should the PG not be available, to identify the specific landform for each site and its relationship to ~~specific ancient lakeshores~~ **prior playa shorelines** of Palen Dry Lake. If a**n identifiable shoreline** is present within 100 meters of the site boundary, include it on the site map;

3. Map any differential distribution of artifacts and suggest an explanation for

this distribution;

4. Assess the integrity of the site and state the evidence substantiating that opinion;

5. Collect all artifacts after their locations are marked and submit them for laboratory analysis;

6. Excavate one 1-meter-by-1-meter unit in 10-centimeter levels until three sterile levels are encountered, or until the unit reaches maximum depth of planned impact, placing this unit in the part of the site with the highest artifact density; or, if multiple artifact concentrations were identified, place one 1-meter-by-1-meter excavation unit in the center of each concentration and excavate as just described; retain any artifacts for laboratory analysis;

7. Determine the vertical and horizontal limits of the each site by placing test units at four locations equally spread around the surface exterior edge and excavating or probing down to the Holocene basement, using a shovel, hand auger, or similar technique; continue exploration in all directions until the horizontal limits of the site are reached; retain any artifacts for laboratory analysis;

8. Excavate the surface feature or features, using the methods described in the CRMMP; record their locations on the site map, retain samples, such as flotation, pollen, and charcoal, for analysis, and retain all artifacts for professionally appropriate laboratory analyses and curation, until data recovery is complete;

9. Notify the CPM by telephone or e-mail that subsurface deposits were or were not encountered and make a recommendation on the site‘s CRHR eligibility;

10. If no subsurface deposits were encountered, and the CPM agrees the site is not eligible for the CRHR, data recovery is complete;

11. If subsurface deposits were found, develop a sampling design for additional data recovery in consultation with the CRS; plans for this contingency shall be described in detail in the CRMMP;

12. Present the results of the **CUL-12** data recovery in a letter report by the PPA or CRS that shall serve as a preliminary report. Letter reports may address one site, or multiple sites depending on the needs of the CRS. The letter report shall be a concise document that provides description of the schedule and methods used in the field effort, a preliminary tally of the numbers and types of features and deposits that were found, a discussion of the potential range of error for that tally, and a map showing the location of excavation units including topographic contours and the site landforms;

13. Update the existing Department of Parks and Recreation (DPR) 523 site form for these sites, including new data on seasonal drainages, site boundaries, location of each individual artifact, the boundaries around individual artifact concentrations, and the landform;

14. Provide the recovered data to the PTNCL PI-Prehistoric Archaeologist; and

15. Present the final results of data recovery for the complex prehistoric sites in the CRR, as described in **CUL-6**.

Verification:

1. At least 45 days prior to ground disturbance, the project owner shall notify the CPM that data recovery for large complex sites has ensued.

2. Within one week of the completion of data recovery at a site, the project owner shall verify this by submitting a letter report written by the PPA or CRS for review and approval of the CPM. When the CPM approves the letter report, ground disturbance may begin at these site locations.

CUL-13 DATA RECOVERY FOR HISTORIC-PERIOD REFUSE SCATTERS

Prior to the start of ground disturbance, the project owner shall ensure that a recovery plan is included in the CRMMP for upgrading the recordation of historic-period refuse scatter sites located on the proposed plant site. ~~For Reconfigured Alternative # 3, t~~**T**hese consist of sites SMP-H-1003, SMP-H-1004, SMP-H-1006, SMP-H-1008, SMP-H-1009, SMP-H-1010, SMP-H-1011, SMP-H-1012, SMP-H-1013, SMP-H-1020, SMP-H-1021, SMP-H 1022, SMP-H-1023, SMP-H-2002, SMP-H-2003, SMP-H-2004, SMP-H-2006, SMP-H-2007, SMP-H-2008, SMP-H-2010, SMP-H-2011/12, SMP-H-2017, SMP-H-2019, SMP-H-2021; ~~JR-101, JR-102,~~ JR-104, **JR-105,** **JR-107,** JR-109, JR-110; TC-008, TC-009, TC-020, and TC-032. ~~For Reconfigured Alternative #2, the sites requiring upgraded recordation consist of the same sites as Reconfigured Alternative #3 plus site JR-107.~~ **This** site list~~s~~ may be revised only with the agreement of the CRS and the CPM.

The focus of the recordation upgrade is to determine if these sites can be attributed to the DTC/C-AMA use of the region and are therefore contributors to the DTCCL. The plan shall specify in detail the location recordation equipment and methods to be used and describe any anticipated post-processing of the data. The project owner shall then ensure that the CRS, the PHA, and/or archaeological team members implement the plan, if allowed by the BLM, which shall include, but is not limited to the following tasks:

1. The project owner shall hire a PHA with the qualifications described in **CUL-3** to supervise the field work.

2. The project owner shall ensure that, prior to beginning the field work, the PHA and crew chief are trained by the DTCCL Historical Archaeologist, or equivalent qualified person approved by the CPM and hired by the project owner should the DTCCL Historical Archaeologist not be available, to identify the specific landform for each site; in the identification, analysis and interpretation of the artifacts, environmental modifications, and trash disposal patterns associated with the early phases of WWII land-based U.S. army activities, as researched and detailed by the DTCCL PI-Historian and the DTCCL Historical Archaeologist.

3. The project owner shall ensure that, prior to beginning the field work, the field crew members are also trained in the consistent and accurate identification of the full range of late nineteenth and early-to-mid-twentieth-century can, bottle, and ceramic diagnostic traits.

4. The project owner shall ensure that the original site map shall be updated to include at minimum: landform features such as small drainages, any man-made features, the limits of any artifact concentrations and features, using location recordation equipment that has the latest technology with sub-meter accuracy (such as UTM 11 North or California Teale Albers).

5. The project owner shall ensure that a detailed in-field analysis of all artifacts shall be completed, documenting the measurements and the types of seams and closures for each bottle, and the measurements, seams, closure, and opening method for all cans. Photographs shall be taken of maker‘s marks on bottles, any text or designs on bottles and cans, and of decorative patterns and maker‘s marks on ceramics. Artifacts shall not be collected.

6. The project owner shall ensure that the details of what is found at each site shall be presented in a letter report from the CRS or PHA, which shall serve as a preliminary report, that details what was found at each site, as follows:

    a. Letter reports may address one site, or multiple sites depending on the needs of the CRS; and

    b. The letter report shall be a concise document that provides a description of the schedule and methods used in the field effort, a preliminary tally of the numbers and types of features and deposits that were found, a discussion of the potential range of error for that tally, and a map showing the location of collection and/or excavation units, including topographic contours and the site landforms.

    c. The letter report shall make a recommendation on whether each site is a contributor to the DTTCL.

7. The project owner shall ensure that the data collected from the field work shall be provided to the DTCCL Historical Archaeologist to assist in the determination of which, if any, of the historic-period sites are contributing elements to the DTCCL.

8. The project owner shall ensure that the PHA analyzes all recovered data and writes, or supervisors the writing of a comprehensive final report. This report shall be included in the CRR (**CUL-6**). ~~Relevant portions of the information gathered shall be included in the possible NRHP nomination for the DTCCL (funded by **CUL-2**).~~

Verification:

1. At least 45 days prior to ground disturbance, the project owner shall notify the CPM that mapping and upgraded in-field artifact analysis has ensued on the historic-period refuse scatter sites.

2. Within one week of completing data recovery at a site, the project owner shall submit to the CPM for review and approval a letter report written by the CRS, evidencing that the field portion of data recovery at each site has been completed. When the CPM approves the letter report, ground disturbance may begin at the site location(s) that are the subject of the letter report.

CUL-14 DATA RECOVERY FOR HISTORIC-PERIOD SITES WITH FEATURES

Prior to the start of ground disturbance, the project owner shall ensure that a data recovery plan is included in the CRMMP for evaluation and data recovery from historic-period archaeological sites with features. ~~For Reconfigured Alternative #3, t~~**T**hese sites consist of sites SMP-H-1005, SMP-H-1007, SMP-H-2016**, and** ~~. For Reconfigured Alternative #2, these sites consist of the same sites as Reconfigured Alternative #3, plus site~~ JR-108. ~~These~~ **This** site list~~s~~ may be revised only with the agreement of the CRS and the CPM. The plan shall specify in detail the location recordation equipment and methods to be used and describe any anticipated post-processing of the data. The project owner shall then ensure that the CRS, the PHA, and/or archaeological team members implement the plan, if allowed by the BLM, which shall include, but is not limited to the following tasks:

1. The project owner shall hire a PHA with the qualifications described in **CUL-3** to supervise the field work.

2. The project owner shall ensure that, prior to beginning the field work, the PHA and crew chief are trained by the DTCCL Historical Archaeologist, or equivalent qualified person approved by the CPM and hired by the project owner should the DTCCL Historical Archaeologist not be available, in the identification, analysis and interpretation of the artifacts, environmental modifications, and trash disposal patterns associated with the early phases of WWII land-based U.S. army activities, as researched and

detailed by the DTCCL PI-Historian and the DTCCL Historical Archaeologist.

3. The project owner shall ensure that, prior to beginning the field work, the field crew members are also trained in the consistent and accurate identification of the full range of late nineteenth and early-to-mid-twentieth-century can, bottle, and ceramic diagnostic traits.

4. The project owner shall ensure that the original site map shall be updated to include at minimum: landform features such as small drainages, any man-made features, the limits of any artifact concentrations and features (previously known and newly found in the metal detector survey), using location recordation equipment that has the latest technology with sub-meter accuracy (such as UTM 11 North or California Teale Albers).

5. The project owner shall ensure that a detailed in-field analysis of all artifacts shall be completed, if not done previously. Types of seams and closures for each bottle and all cans shall be documented. Photographs shall be taken of any text or designs. Unusual or unidentifiable artifacts may be collected for further analysis, but otherwise artifacts shall not be collected.

6. The project owner shall ensure a systematic metal detector survey be completed at each site, and that each “hit” is investigated. All artifacts and features thus found must be mapped, measured, photographed, and fully described in writing.

7. The project owner shall ensure that all features are recorded, and that any features having subsurface elements are excavated by a qualified historical archaeologist. All features and contents must be mapped, measured, photographed, and fully described in writing.

8. The project owner shall ensure that the details of what is found at each site shall be presented in a letter report from the CRS or PHA which shall serve as a preliminary report, that details what was found at each site, as follows:

    a. Letter reports may address one site, or multiple sites depending on the needs of the CRS; and

    b. The letter report shall be a concise document that provides a description of the schedule and methods used in the field effort, a preliminary tally of the numbers and types of features and deposits that were found, a discussion of the potential range of error for that tally, and a map showing the location of collection and/or excavation units, including topographic contours and the site landforms.

c. The letter report shall make a recommendation on whether each site is a contributor to the DTCCL.

9. The project owner shall ensure that the data collected from the field work shall be provided to the DTCCL Historical Archaeologist to assist in the determination of which, if any, of the historic-period sites are contributing elements to the DTCCL.

10. The project owner shall ensure that the PHA analyzes all recovered data and writes or supervises the writing of a comprehensive final report. This report shall be included in the CRR **(CUL-6**). ~~Relevant portions of the information gathered shall be included in the possible NRHP nomination for the DTCCL (funded by **CUL-2**).~~

Verification:

1. At least 45 days prior to ground disturbance, the project owner shall notify the CPM that mapping and in-field artifact analysis has ensued on historic-period sites with features.

2. Within one week of completing data recovery at a site, the project owner shall submit to the CPM for review and approval a letter report written by the CRS, evidencing that the field portion of data recovery at each site has been completed. When the CPM approves the letter report, ground disturbance may begin at the site location(s) that are the subject of the letter report.

CUL-15 DATA RECOVERY ON HISTORIC-PERIOD ROADS

The project owner shall ensure that a qualified architectural historian (must meet the U.S. Secretary of the Interior's Professional Qualifications Standards for historian, as published in Title 36, Code of Federal Regulations, part 61) conducts research and writes a report on the age and use of SMP-H-1032.

~~The project owner shall provide the historian's report to the DTCCL PI-Historian for possible use in the DTCCL NRHP nomination, if appropriate.~~

The project owner may undertake this task prior to Energy Commission certification of the project.

Verification:

1. At least 15 days prior to ground disturbance, the project owner shall submit to the CPM the historian's report documenting the age and historical use of the road.

2. Within 15 days after the CPM approves the report, the project owner shall forward it to the DTCCL PI-Historian.

CUL-16 COMPLIANCE WITH BLM PROGRAMMATIC AGREEMENT

~~If provisions in the BLM PSEGS Programmatic Agreement and associated implementation and monitoring programs conflict with or duplicate these~~

~~Conditions of Certification, the BLM provisions shall take precedence. Provisions in these Conditions that are additional to or exceed BLM provisions and represent requirements under the Energy Commission's CEQA responsibilities shall continue to apply to the project's activities, contingent on BLM's approval as authorized by federal law.~~

CUL-17 TREATMENT OF THE IRONWOOD HISTORIC MINING DISTRICT

The project owner shall design and conduct a reconnaissance pedestrian (class II) survey of the Southwestern Palen Mountains Mining Area. The principal purpose of these surveys is to document a statistically valid sample of the historical archaeological deposits in the subject portion of the Ironwood Historic Mining District. The primary, although not exclusive focus of the survey shall be historical archaeological resources that relate to the historical development and sporadic operation of the Ironwood Mining District. An important secondary focus of the survey shall be the documentation of mineral-bearing placer and lode deposits, both those that exhibit evidence of prospecting and extraction and those where such evidence is not apparent.

The research design and the methods used for this class II survey shall reflect the character of the subject resource area, the Southwestern Palen Mountains Mining Area, and include thorough documentation of each archaeological resource, prehistoric as well as historical, and of mineral-bearing placer and lode deposits. The sample design and the field methods for the subject mining area shall evidence a balanced consideration of local topographic constraints and the requirement to acquire a statistically valid sample of the area. The project owner shall completely document every archaeological site found on California State Parks DPR 523 Series forms per California State Parks instructions (CA State Parks 1995). The descriptions of resource assemblages and the spatial distribution internal to those assemblages shall be detailed enough on the subject forms to facilitate meaningful archaeological analysis of the surface manifestation of each archaeological resource. Documentation of potential mineral-bearing placer and lode deposits shall include field notes and photographs of each such deposit, vicinity and larger-scale location maps, submeter GPS coordinates, and, for potential mineral-bearing lode deposits, assay samples sufficient for professional laboratory assays and hand samples sufficient for formal identification. The research design for the survey of the area shall also provide for other specialized laboratory analyses, as appropriate.

Verification:

1. **Within 90 days of the start of ground disturbance, the project owner shall submit, for the review and approval of the CPM, a draft research design for**

reconnaissance pedestrian (class II) survey of the Southwestern Palen Mountains Mining Area. The research design shall be explicit about the methods to be used in the survey of the area and the anticipated routes of the pedestrian transects through it.

2. **Prior to the project owner's submission of the draft technical report of the results of the class II pedestrian survey of the subject mining area, the project owner shall first submit, for the review and approval of the CPM, California State Parks DPR 523 Series form sets, complete per California State Parks instructions (CA State Parks 1995) and in accordance with the language of this condition of certification.**

3. **Upon the approval of the CPM, the project owner shall, within 14 days of said approval, formally submit each approved DPR 523 Series form set for each cultural resource to the Eastern Information Center of the California Historical Resources Information System and to the BLM's Palm Springs-South Coast Field Office.**

4. **Within 120 days of the CPM's approval of the research design for the Southwestern Palen Mountains Mining Area, the project owner shall submit, for the review and approval of the CPM, a draft technical report of the results of the class II pedestrian survey for the area.**

5. **Upon the approval of the CPM, the project owner shall, within 14 days of said approval, formally submit the approved technical report of the results of the class II pedestrian survey to the Eastern Information Center of the California Historical Resources Information System and to the BLM's Palm Springs-South Coast Field Office.**

6. **Should the project owner petition to suspend or terminate the license for the subject facility subsequent to the execution of any fieldwork that had been done in partial fulfillment of this condition, yet prior to the submission of draft DPR 523 Series form sets or a draft technical report, the project owner shall, no later than 90 days prior to filing a petition to suspend or terminate said license, submit complete draft form sets for each field-observed cultural resource to the CPM, the Eastern Information Center of the California Historical Resources Information System, and the BLM's Palm Springs-South Coast Field Office, and further submit, to the CPM and the BLM's Palm Springs-South Coast Field Office, organized and legible copies of all of the field documentation for the surveys that have been completed by that time and the drafts, however incomplete, of the technical report in preparation.**

CULTURAL RESOURCES ACRONYM GLOSSARY

PALEN SOLAR ELECTRIC GENERATING PROJECT

AC	Alternating Current
ACEC	Area of Critical Concern
ACHP	Advisory Council on Historic Preservation
A.D.	After the Birth of Christ
AFC	Application for Certification
AIRFA	American Indian Religious Freedom Act
ARMR	Archaeological Resource Management Report
ARPA	Archaeological Resources Protection Act
B.C.	Before the Birth of Christ
BLM	Bureau of Land Management
CCS	Cryptocrystalline silicate
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CHRIS	California Historical Resources Information System
Conditions	Conditions of Certification
CPM	Compliance Project Manager
CRHR	California Register of Historical Resources
CRIT	Colorado River Indian Tribes
CRM	Cultural Resources Monitor
CRMMP	Cultural Resources Monitoring and Mitigation Plan
CRR	Cultural Resource Report
CRS	Cultural Resources Specialist
DC	Direct Current

DPR 523	Department of Parks and Recreation cultural resource inventory form
DTCCL	Desert Training Center Cultural Landscape
DTC/C-AMA	Desert Training Center/California-Arizona Maneuver Area
EIC	Eastern Information Center, University of California, Riverside
FAR	Fire-affected Rock
FSA	Final Staff Assessment
GLO	General Land Office
GPS	Global Positioning System
KOP	Key Observation Point (see also VISUAL RESOURCES section of FSA)
LORS	laws, ordinances, regulations, and standards
MCR	Monthly Compliance Report
MLD	Most Likely Descendent
MW	Megawatt
NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission
NAM	Native American Monitor
NHPA	National Historic Preservation Act
NILS	National integrated Land System
NPS	National Park Service
NRHP	National Register of Historic Places
OHP	Office of Historic Preservation
PA	Programmatic Agreement
PAA	Project Area of Analysis
PHA	Project Historical Archaeologist
PPA	Project Prehistoric Archaeologist

PRGTL	Pacific to Rio Grande Trails Landscape
Project Site	The bounded area(s) identified by an applicant or project owner as the area(s) within which they propose to build the project.
PSA	Preliminary Staff Assessment
PSEGS	Palen Solar Electric Generating System
PSH	Palen Solar Holdings, LLC
PTNCL	Prehistoric Trails Network Cultural Landscape
REAP	Rapid Ethnographic Assessment Procedures
RSA	Revised Staff Assessment
SHPO	State Historic Preservation Officer
SRSG	solar receiver steam generator
Staff	Energy Commission cultural resources technical staff
TCP	Traditional Cultural Property
THPO	Tribal Historic Preservation Officer
UTM	Universal Transverse Mercator
WEAP	Worker Environmental Awareness Program

REFERENCES

The "(TN 00000)" in a reference below indicates the transaction number under which the item is catalogued in the Energy Commission's Docket Unit. The transaction number allows for quicker location and retrieval of individual files.

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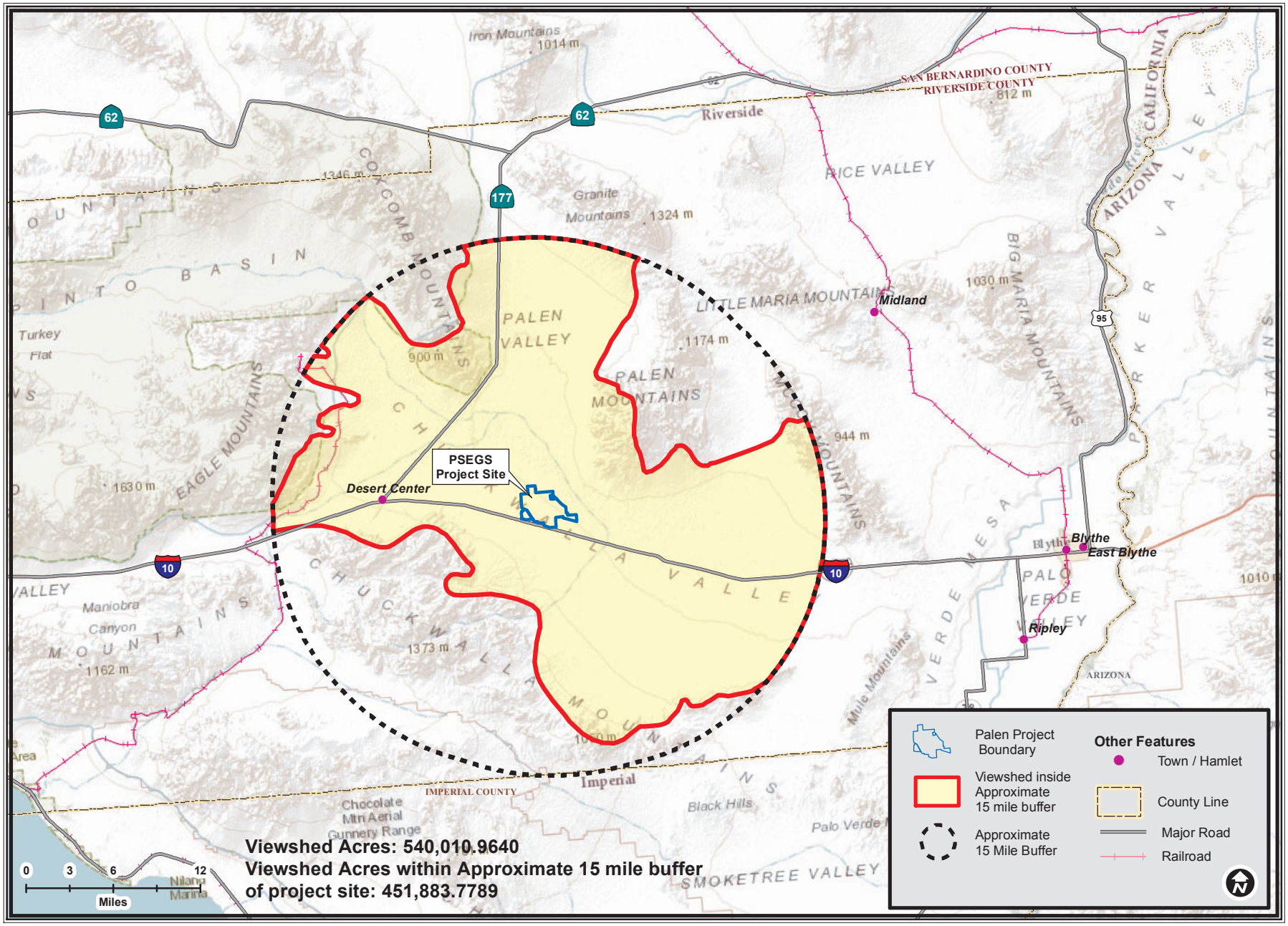
CULTURAL RESOURCES - FIGURE 1

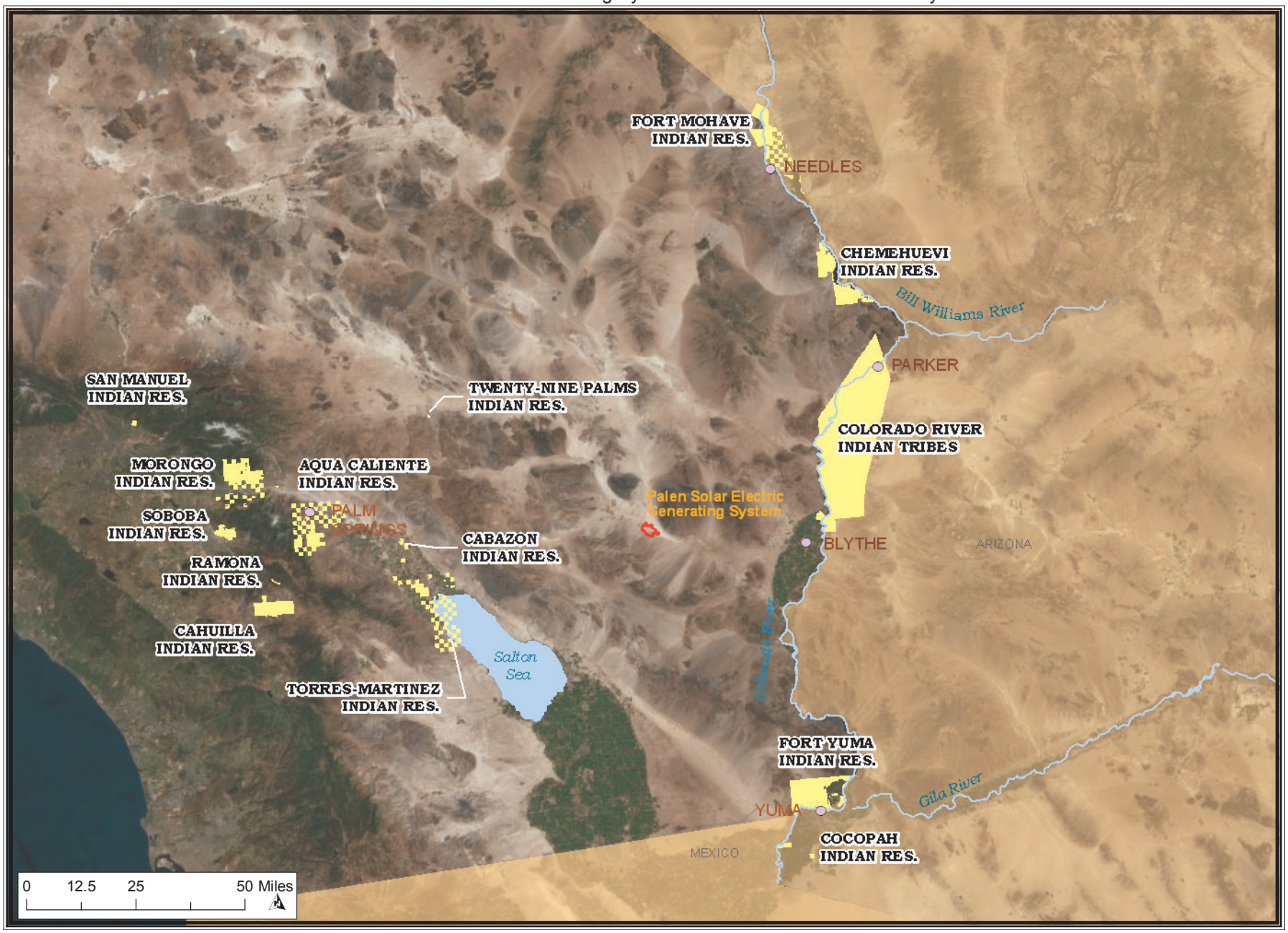
Palen Solar Electric Generating System - Viewshed Acreage and Viewshed Acreage within Approximate15 Mile Buffer of Project Site



CALIFORNIA ENERGY COMMISSION - SITING,TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: ESRI, Delorme, Tele Atlas

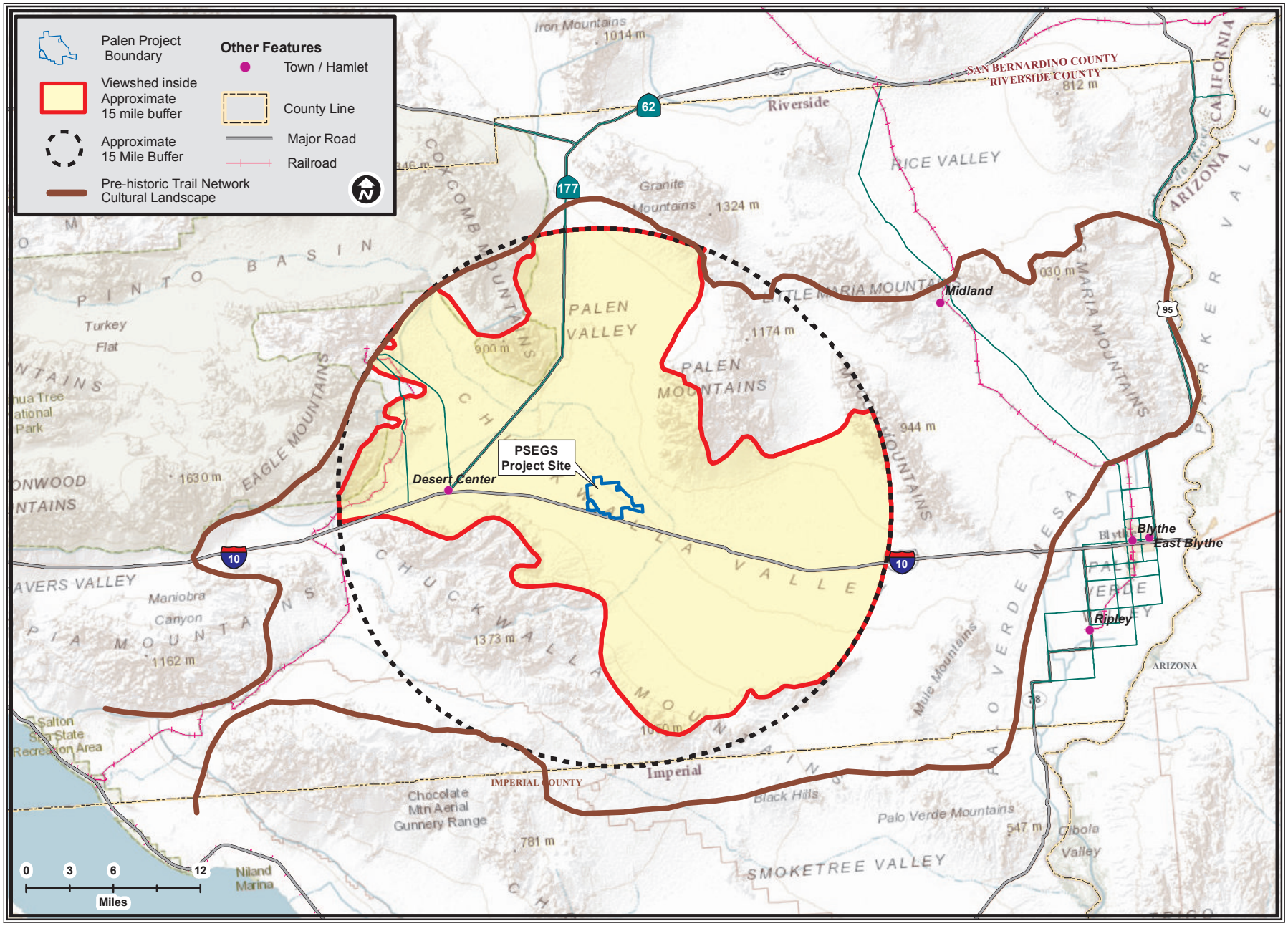
CULTURAL RESOURCES - FIGURE 2
Palen Solar Electric Generating System - California Post-19th Century



CALIFORNIA ENERGY COMMISSION, SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: TeleAtlas, BIA, BING Aerial Imagery

CULTURAL RESOURCES - FIGURE 3

Palen Solar Electric Generating System - PTNCL Overlay



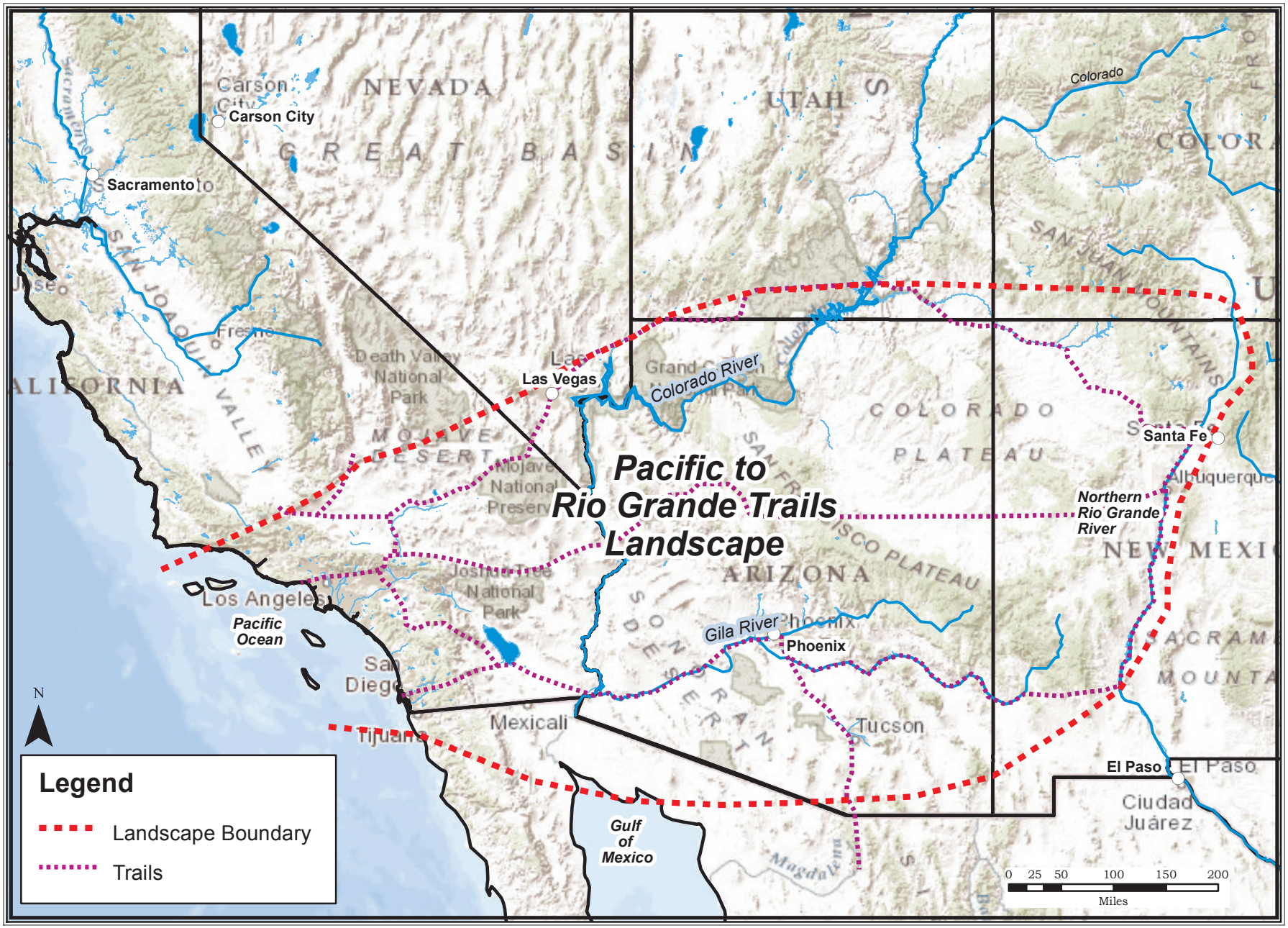
CULTURAL RESOURCES

CALIFORNIA ENERGY COMMISSION - SITING,TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: ESRI, Delorme, Tele Atlas

CULTURAL RESOURCES - FIGURE 4

Palen Solar Electric Generating System - Pacific to Rio Grande Trails Landscape



CULTURAL RESOURCES

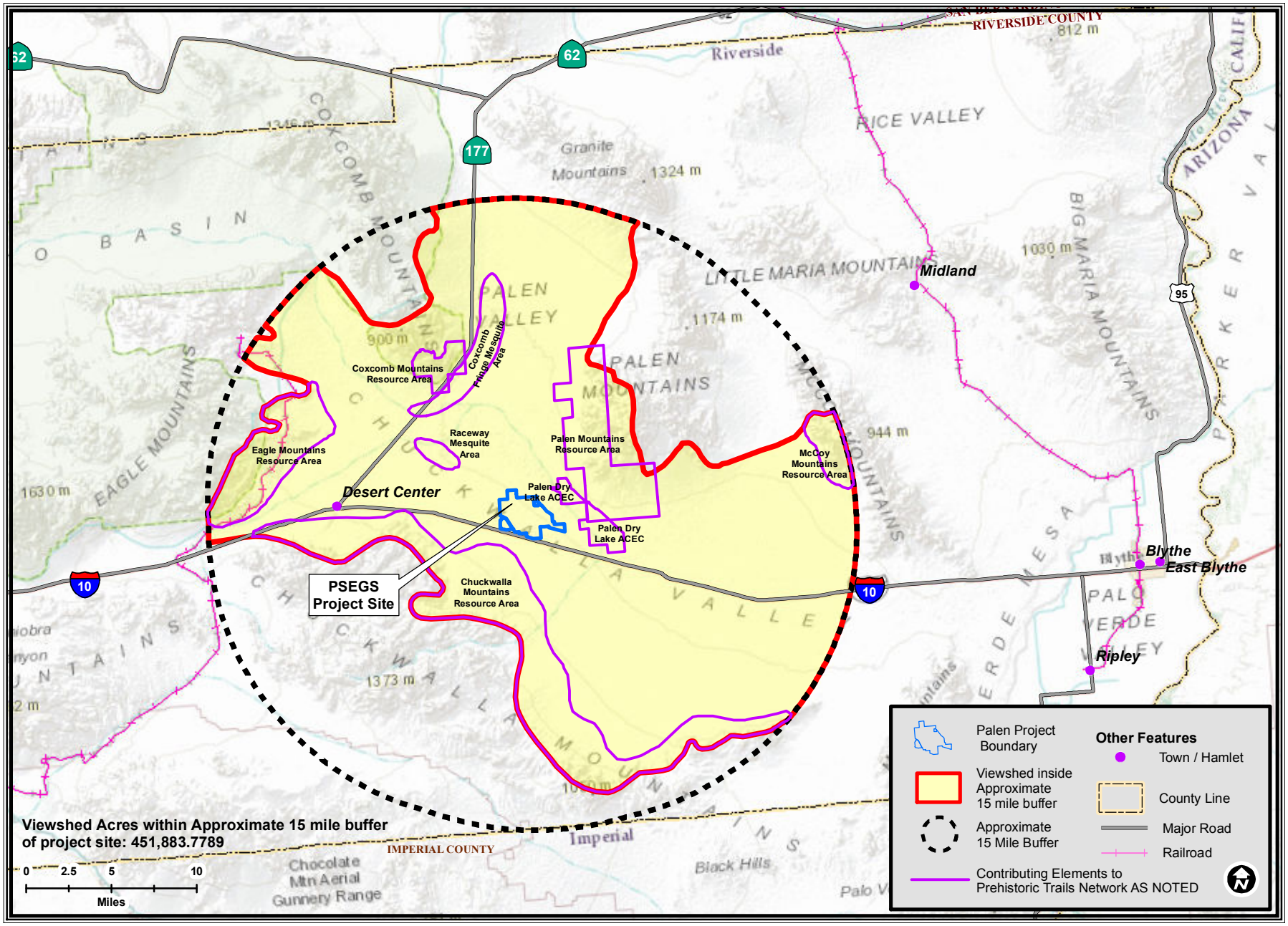
CALIFORNIA ENERGY COMMISSION - SITING,TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: ESRI, Delorme, Tele Atlas, CEC

Figure 5 is redacted

CULTURAL RESOURCES - FIGURE 6

Palen Solar Electric Generating System - Natural and Mesquite Resource Areas of the Chuckealla Valley porttion of the PRGTL



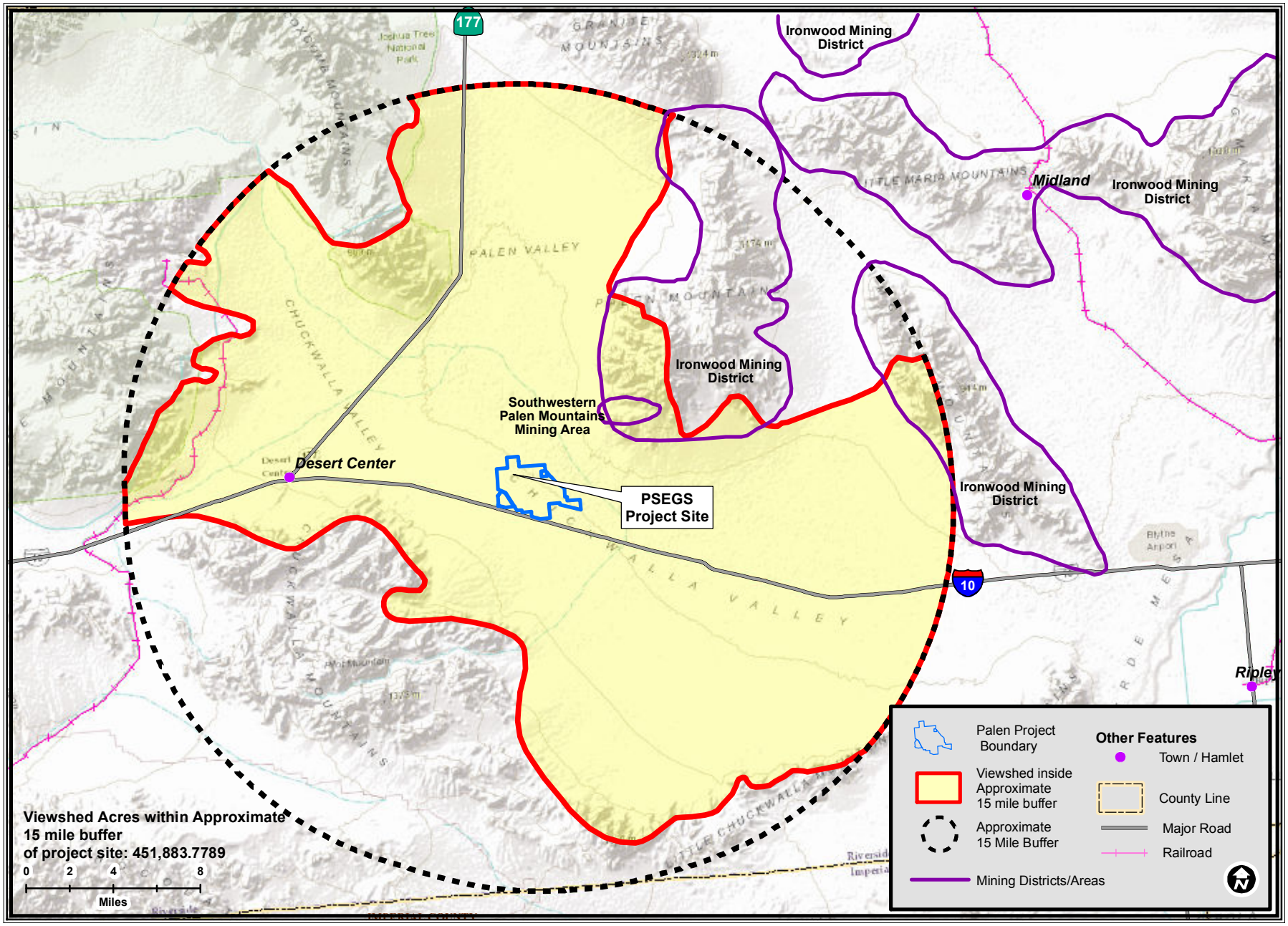
CULTURAL RESOURCES

CALIFORNIA ENERGY COMMISSION - SITING,TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: ESRI, Delorme, Tele Atlas

CULTURAL RESOURCES - FIGURE 7

Palen Solar Electric Generating System - Mining Area, Ironwood Historic Mining District



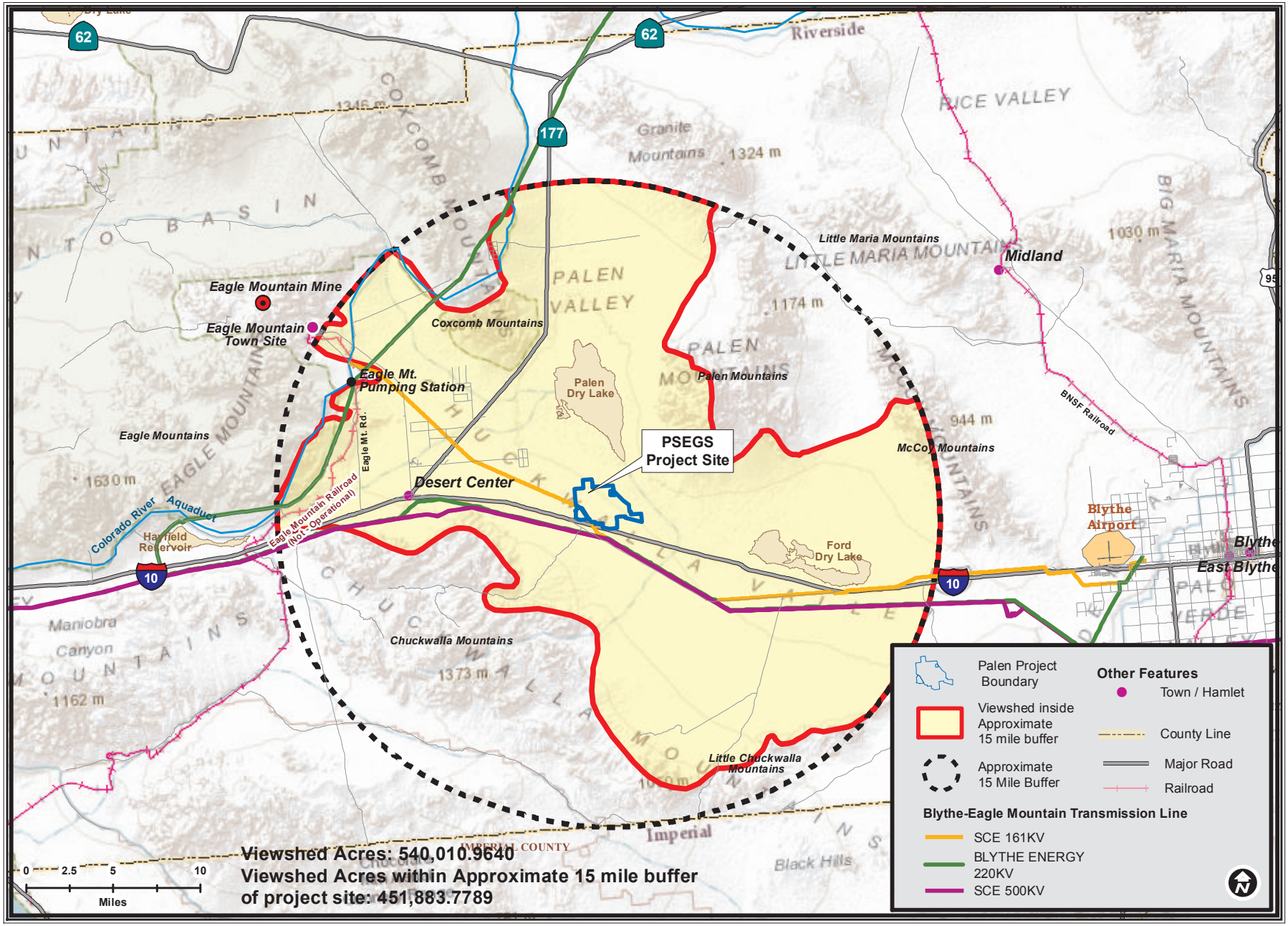
CULTURAL RESOURCES

CALIFORNIA ENERGY COMMISSION - SITING,TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: ESRI, Delorme, Tele Atlas

CULTURAL RESOURCES - FIGURE 8

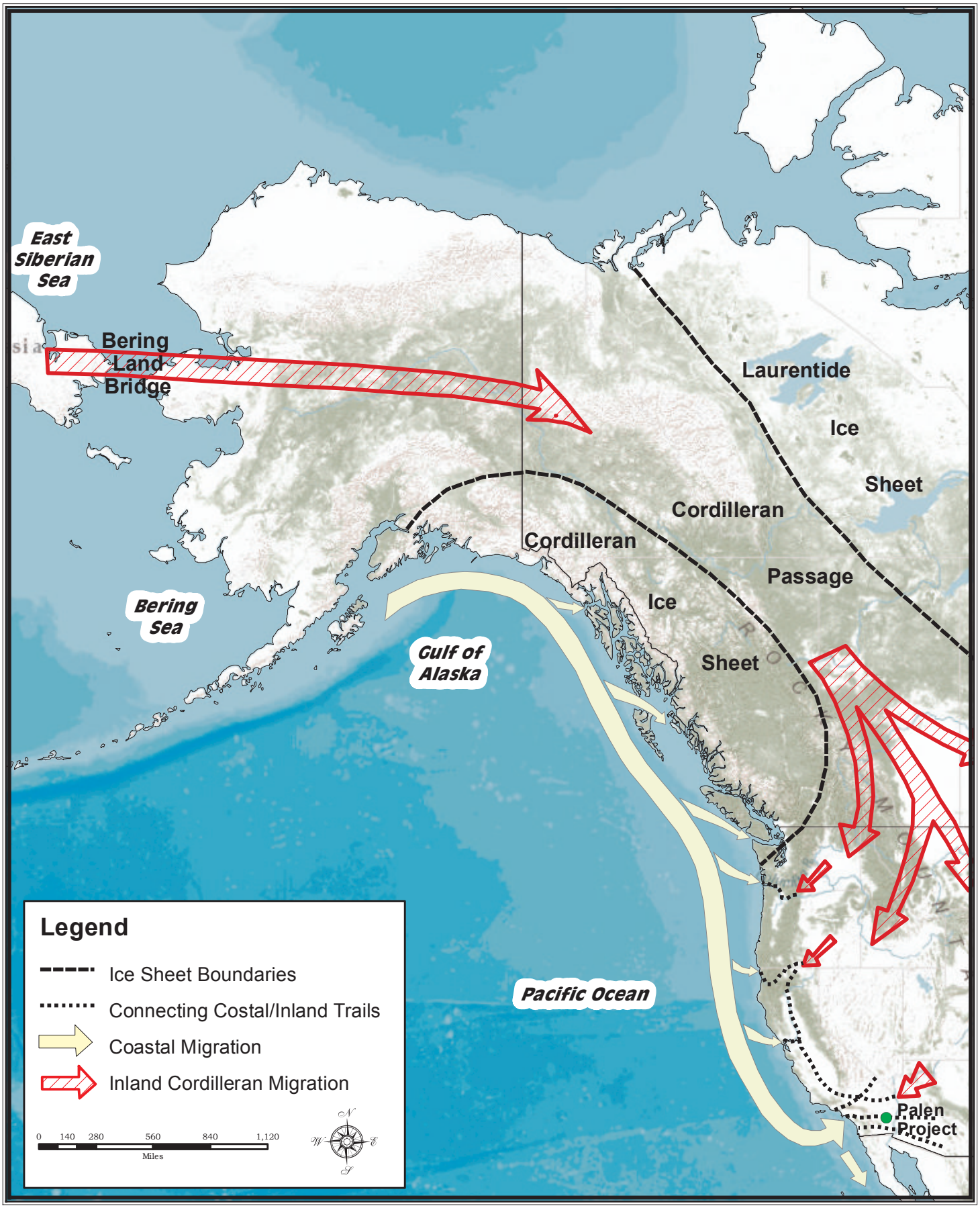
Palen Solar Electric Generating System - Built Environment Resources



CALIFORNIA ENERGY COMMISSION - SITING,TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: ESRI, Delorme, Tele Atlas

CULTURAL RESOURCES - FIGURE 9
Palen Solar Electric Generating System - Migration

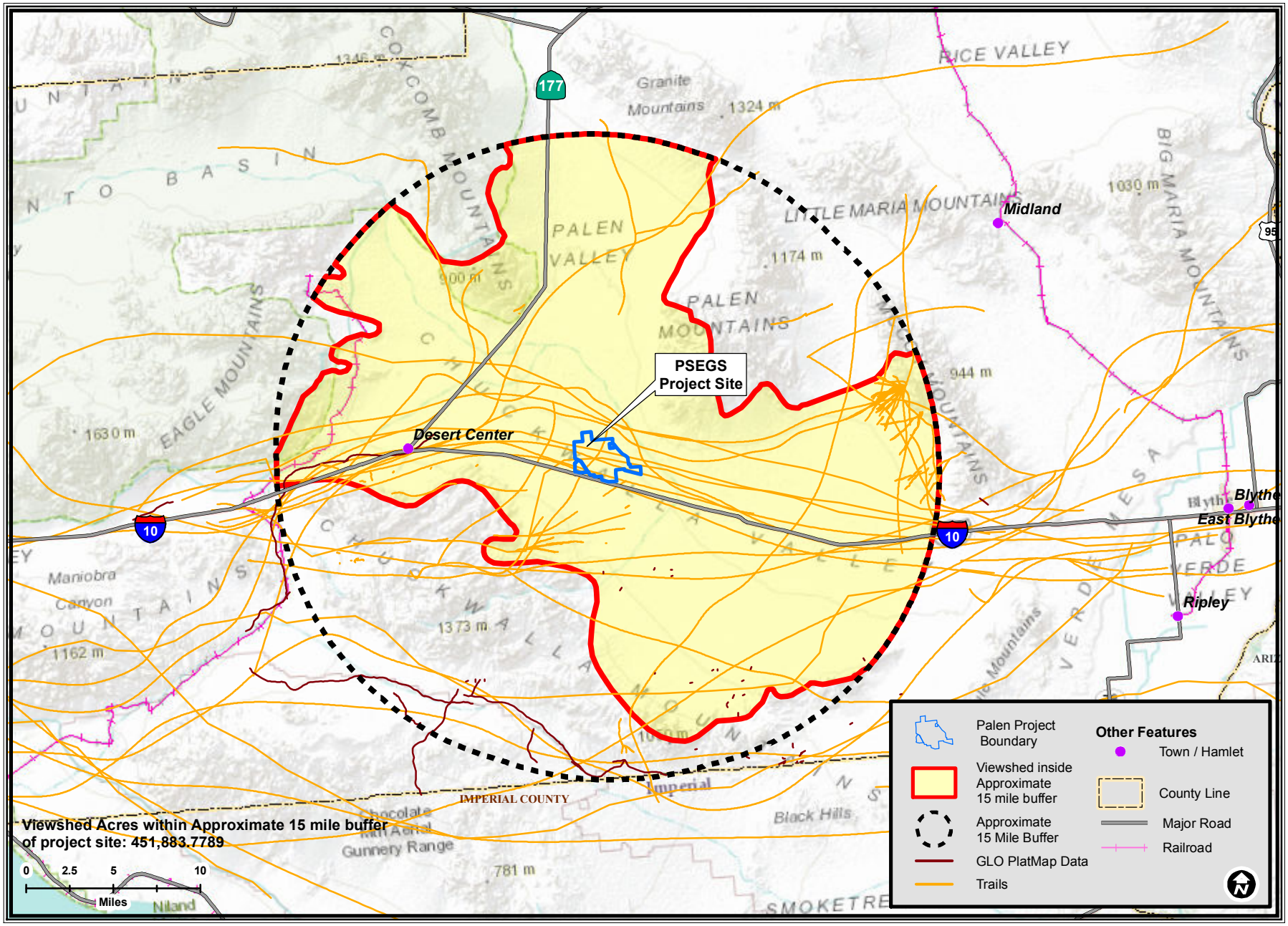


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMETAL PROTECTION DIVISION

SOURCES: Fagan, Brian, 2003. "Before California: An Anchaelogist Looks at Our Earliest Inhabitants", Walnut Creek Altamira Press, Figure 2.1, Page 48.
Michael Barton and George Pearson, 2004. "The Settlement of the American Continents: A Multidisciplinary Approach to Human Biogeography", Tuscon, AZ, The University of Arizona Press.
ESRI, DeLorme, NAVTEQ, TomTom, USGS.

CULTURAL RESOURCES - FIGURE 10

Palen Solar Electric Generating System - Trails of the Chuckwalla Valley Portion of the PRGTL



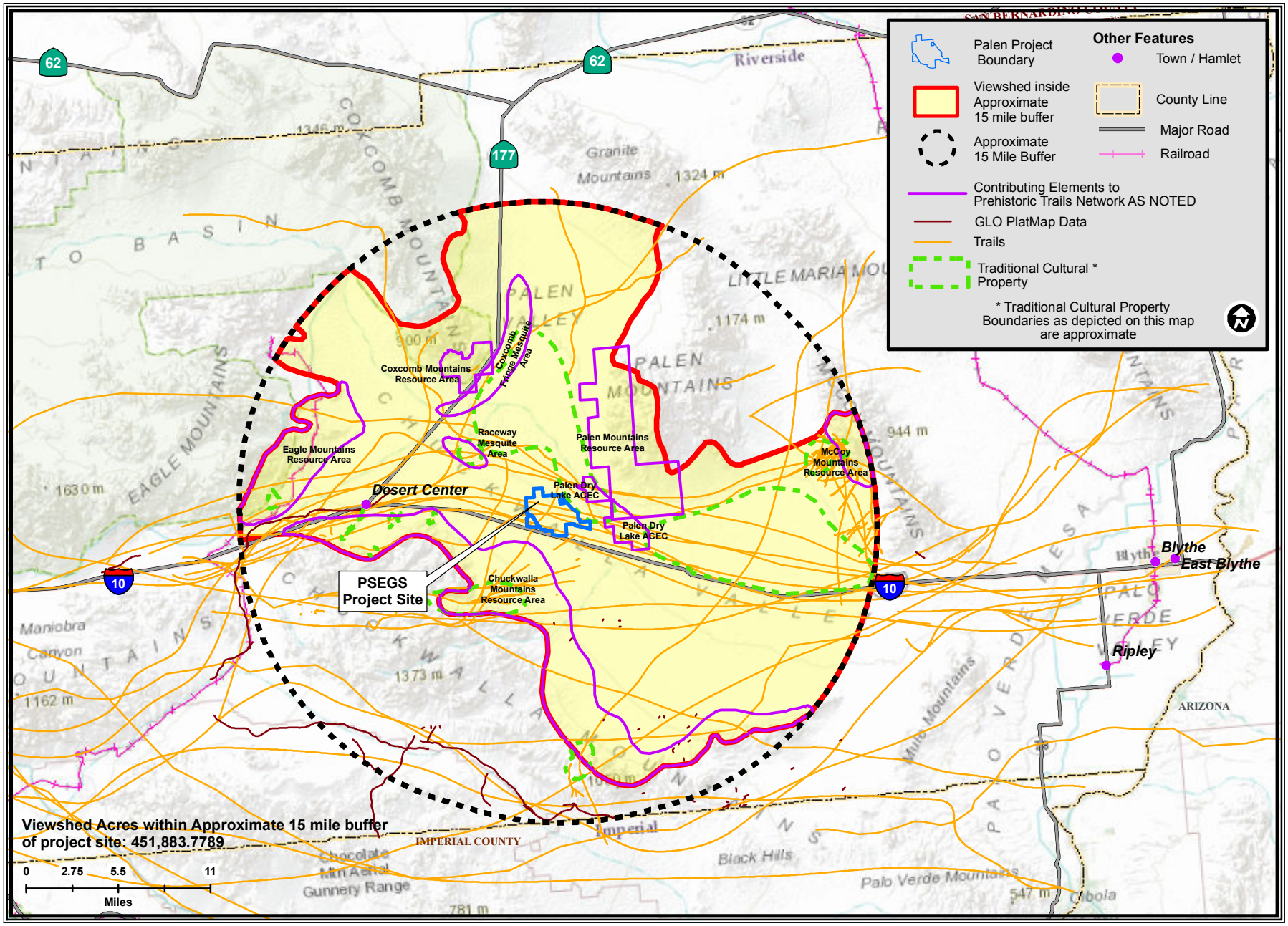
CULTURAL RESOURCES

CALIFORNIA ENERGY COMMISSION - SITING,TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: ESRI, Delorme, Tele Atlas

CULTURAL RESOURCES - FIGURE 11

Palen Solar Electric Generating System - Archaeological Areas, Trails and other Contributing Elements to the Chuckwalla Valley portion of the PRGTL



CULTURAL RESOURCES

CALIFORNIA ENERGY COMMISSION - SITING,TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: ESRI, Delorme, Tele Atlas

Declarations

&

Resumes

DECLARATION OF
Matthew J. Braun

I, Matthew J. Braun, declare as follows:

1. I am presently employed by the California Energy Commission in the Cultural Resources Unit, Environmental Protection Office, Siting, Transmission and Environmental Protection Division as an Energy Planner II.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on Cultural Resources, for the Palen Solar Electric Generating System project (09-AFC-7C) based on my independent analysis of the Petition to Amend and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

   I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 9/20/2013 Signed: Matthew J. Braun

At: Sacramento, California

MATTHEW BRAUN
Associate, Cultural Resources

Academic Background

MA, Anthropology (Archaeology), Northern Illinois University, 2012
BS, Anthropology and Psychology, University of Pittsburgh, 2004

Professional Experience

Mr. Braun has over 7 years of experience conducting archaeological field work, consulting with Native American groups, researching, analyzing, and writing about Native American concerns, archaeology, ethnohistory, anthropology, cultural and ethnographic landscapes and paleontology. Mr. Braun has experience preparing environmental documents pursuant to applicable federal, state and local regulations in compliance with the National Environmental Policy Act (NEPA), Section 106 and 110 of the National Historic Preservation Act (NHPA), and the California Environmental Quality Act (CEQA).

Aspen Environmental Group……2012-present

California Energy Commission. Aspen has a multi-year contract to provide support to the Energy Facility Planning and Licensing Programs. Under this contract, Mr. Braun has participated in the following projects:

- **Rio Mesa Solar Electric Generating Facility (2012-2013).** Mr. Braun conducted analyses of impacts to archaeological resources, ethnographic resources and ethnographic landscapes through fieldwork, archival research and interviews with local Native American tribal representatives from the area near the 3,960 acre 500 MW solar concentrating thermal plant located on the Palo Verde Mesa near Blythe, California. Important resource issues include impacts to trail systems, prehistoric archaeological sites, plant and animal resources, and other elements that are part of a Native American tribe's ethnographic landscape. This was a large, complex project, coordinated with other solar projects and with Native American representatives from the Fort Mojave Tribe, the Chemehuevi Tribe, the Colorado River Indian Tribes, the Agua Caliente Band of Cahuilla Indians, and the Fort Yuma Quechan Tribe.

- **Hydrogen Energy California (HECA) (2012-present).** Mr. Braun conducted analyses of impacts to ethnographic resources and ethnographic landscapes through consultation with local Native American Tribal representatives and archival research of the area near the 453 acre 400 MW Integrated Gasification Combined Cycle (IGCC) power plant and associated linear facilities. Important resources include known and unknown burials, traditional gathering and hunting areas, and other ethnographic resources. This project was coordinated with the Department of Energy and Native American representatives from the Tejon Indian Tribe and the Tubatalabals of Kern County.

- **Palen Solar Electric Generating Facility (2013-present).** Mr. Braun is conducting analyses of impacts to ethnographic resources through fieldwork, archival research and interviews with Native American tribal representatives from the area near the 3,794 acre concentrating solar thermal plant located near Desert Center, California. He is the lead author of the ethnographic technical report, and co-author to the Staff Assessment issued by the CEC. Important resource issues include impacts to cultural landscapes, components of which include trail systems, archaeological sites, plant and animal resources, rock art and earth figures, among intangible spiritual and religious values. This is a large, complex project coordinated with other solar projects and with Native American representatives from the Chemehuevi Tribe, Colorado River Indian Tribes, Fort Mojave Tribe, Fort Yuma Quechan Tribe, Cocopah Indian Tribe, Morongo Band of Cahuilla Indians, San Manuel Band of Mission Indians, Agua Caliente Band of Cahuilla Indians, Cabazon Band of Mission Indians, and Soboba Band of Luiseño Indians.

- **Desert Renewable Energy Conservation Plan (DRECP) (2013-present)**. Mr. Braun is conducting analyses on a programmatic level of impacts to cultural resources that could be impacted by the development of sources of renewable energy in the Mojave and Colorado Deserts, an area encompassing over 22 million acres. This is a complex document that requires coordination with the California Energy Commission, the Bureau of Land Management, the U.S. Fish and Wildlife Service, and the California Department of Fish and Wildlife.

San Luis Obispo County

- **California Valley Solar Ranch, Compliance (2012-present).** The CVSR project is a 250 MW solar photovoltaic power plant on the Carrizo Plain in rural San Luis Obispo County. The solar arrays for the project will cover nearly 2,000 acres. Mr. Braun serves as an assistant technical reviewer for cultural resources and paleontology during the compliance process. Duties include the review of licensees' submittals and actions related to compliance with cultural resources and paleontological conditions of approval and providing recommendations to the County regarding acceptability.

San Bernardino County

- **Donnell Basin Flood Control Project (2013).** Mr. Braun conducted archaeological survey of the 65 acre Donnell Basin, an area proposed by the San Bernardino Flood Control District to be used for overflow in the Twenty-nine Palms area. Important resource issues included a prehistoric quarry and built-environment resources.

Belectric, Inc. (2013)

- **Costa Photovoltaic Solar Energy Facility, Cultural Resources Reconnaissance Survey and Technical Report (2013).** Mr. Braun conducted a cultural resources reconnaissance survey and co-authored a technical report in support of a CEQA review and preparation of an Initial Study for a proposed 170 acres solar energy facility on private land in Kings County, California. Cultural resources identified and evaluated include segments of an historic irrigation canal.
- **Gales Photovoltaic Solar Energy Facility, Cultural Resources Reconnaissance Survey and Technical Report (2013).** Mr. Braun conducted a cultural resources reconnaissance survey and co-authored a technical report in support of a CEQA review and preparation of an Initial Study for a proposed 20 acre solar energy facility on private land in Kings County, California. Cultural resources identified and evaluated include segments of two historic irrigation canals.
- **Venable Photovoltaic Solar Energy Facility, Cultural Resources Reconnaissance Survey and Technical Report (2013).** Mr. Braun conducted a cultural resources reconnaissance survey and co-authored a technical report in support of a CEQA review and preparation of an Initial Study for a proposed 20 acre solar energy facility on private land in the City of Blythe, Riverside County, California.
- **Zuni Photovoltaic Solar Energy Facility, Cultural Resources Reconnaissance Survey and Technical Report (2013).** Mr. Braun conducted a cultural resources reconnaissance survey and co-authored a technical report in support of a CEQA review and preparation of an Initial Study for a proposed 20 acre solar energy facility on private land in the town of Apple Valley, San Bernardino County, California.

Desert Harvest Solar Project (CEQA-equivalent document) (2012). Under contract with EDF Renewable Energy, Mr. Braun assisted senior cultural resources staff with writing the cultural resources, Native American concerns, and paleontology sections of the Desert Harvest EIS. The proposed project is a 1,280 acre 150 MW photovoltaic generating facility in the Chuckwalla Valley near Desert Center, California.

Argonne National Laboratory (Environmental Sciences Division) 2010-2012

The Environmental Sciences Division at Argonne conducts environmental analyses in compliance with NEPA and other applicable environmental regulations. The main Argonne Campus is located in Lemont, Illinois with satellite branches in Denver, Colorado and Washington, D.C.

- **Programmatic Environmental Impact Statement for Solar Energy Development in Six Western States (2010-2012).** Under contract with the BLM, Mr. Braun provided technical expertise by developing, synthesizing, and interpreting prehistoric and historic contexts, ethnohistoric contexts, paleontological contexts and Native American concerns in order to assess the impacts to these resources at the programmatic level and a more focused Solar Energy Zone level. The six western states that were analyzed in this study were California, Nevada, Arizona, Utah, New Mexico, and Colorado. This research involved archival studies, communication and coordination with cooperating partners in the BLM, National Park Service (NPS), State Historic Preservation Officers (SHPO), as well as Native American tribal governments, and responding to and addressing comments from cooperators and the public.
- **Oil Shale and Tar Sands Programmatic Environmental Impact Statement (2011-2012).** Mr. Braun assisted senior cultural resource staff in updating a Class I survey based on GIS data from SHPOs in Wyoming, Colorado and Utah for the BLM. Through the analysis of this data, a predictive model was developed in determining the probability of encountering significant archaeological sites in the affected areas proposed for oil shale and tar sands development.
- **Generic Environmental Impact Statements for License Renewals for the Nuclear Regulatory Commission (NRC) (2010-2012).** Under contract with the Nuclear Regulatory Commission, Mr. Braun conducted archival and site specific analyses for impacts related to the relicensing of NRC permitted facilities for the Diablo Canyon Nuclear Power Plant (California), the Davis Besse Nuclear Power Station (Ohio), and the Grand Gulf Nuclear Station (Mississippi).
- **2012-2012 Outer Continental Shelf Oil and Gas Programmatic Environmental Impact Statement (2012).** Mr. Braun conducted archival research related to whaling practices by indigenous groups on the North Slope, the Chukchi Sea and the St. Lawrence Island regions of Alaska. This information was then used to analyze potential impacts that off-shore oil and gas leases issued by the Bureau of Ocean Energy Management, Regulation and Enforcement would have on indigenous whaling practices.
- **Uranium Leasing Program Programmatic Environmental Impact Statement (2012).** Mr. Braun conducted research analyzing potential impacts to cultural resources in uranium mining lease tracts in Colorado. This research was conducted in conjunction with the Department of Energy which issues the leasing permits and the Colorado and Utah SHPOs.
- **Long-Term Monitoring Strategies for Cultural and Natural Resources Affected by Utility Scale Solar Energy Development on BLM lands (2011).** Mr. Braun collaborated in a multi-disciplinary group to develop strategies for the protection and monitoring of significant resources affected by large-scale solar energy projects on BLM land in California, Nevada, Arizona, Utah, New Mexico and Colorado.
- **National Register of Historic Places Evaluation of Five Test Grids and Buildings at Dugway Proving Ground, Dugway, Utah (2011).** Under contract with the Department of Defense, Mr. Braun conducted field work and evaluations of historic properties related to the chemical and biological weapons testing that occurred at Dugway Proving Ground in the post-World War (WW) II and Cold War Eras. Evaluations were conducted of large-scale grids which were laid out in a pattern to collect sampling information about the rate of dispersal and efficacy of the agent being tested from the air or the ground, as well as evaluations of a naval gun and a WW II Era tar-paper structure.

- **National Register of Historic Places Evaluation of the Intense Pulsed Neutron Source (IPNS) at Argonne National Laboratory, Argonne, Illinois (2012).** Under the direction of senior cultural resources staff, Mr. Braun conducted research related to the history of neutron studies at Argonne and other facilities to evaluate the significance of the IPNS located at Argonne. The IPNS was the first neutron accelerator of its kind constructed in the world, and this user-facility provided physicists extensive knowledge regarding the behavior of high-speed neutron activity.
- **Phase I Cultural Resources Survey for the Materials Design Laboratory at Argonne National Laboratory, Argonne, Illinois (2010).** Mr. Braun assisted senior cultural resources staff in planning, conducting and authoring a Phase I survey for cultural resources potentially affected by construction of the Materials Design Laboratory and ancillary facilities.

American Resources Group……..(2012)

American Resources Group is a cultural resources firm based out of Carbondale, Illinois.

- **Keystone XL Pipeline Phase I Cultural Resources Survey (2012).**

Professional Affiliations and Training

- Section 106 Agreement Documents (National Preservation Institute, 2012)
- Consultation and Protection of Native American Sacred Lands (National Preservation Institute, 2012)
- NEPA and the National Historic Preservation Act (ICF, 2013)
- CEQA and Historic Resources (CPF, 2013)
- Society for American Archaeology
- Society of California Archaeology
- UXO Hazards Training

Honors and Awards

- 2012 Outstanding Graduate Student in Anthropology Award at Northern Illinois University

Selected Publications and Reports

- Braun, Matthew, Robin Connors, and Elizabeth Bagwell. 2013. *Cultural Resources Identification and Evaluation, Gales Photovoltaic Solar Electric Generating Facility, Kings County, California*. Prepared for Belectric, Inc.
- Braun, Matthew, Robin Connors, and Elizabeth Bagwell. 2013. *Cultural Resources Identification and Evaluation, Costa Photovoltaic Solar Electric Generating Facility, Kings County, California*. Prepared for Belectric, Inc.
- Braun, Matthew, Robin Connors, and Elizabeth Bagwell. 2013. *Cultural Resources Identification and Evaluation, Zuni Road Photovoltaic Solar Electric Generating Facility, San Bernardino County, California*. Prepared for Belectric, Inc.
- Braun, Matthew, Robin Connors, and Elizabeth Bagwell. 2013. *Cultural Resources Identification and Evaluation, Venable Photovoltaic Solar Electric Generating Facility, Riverside County, California*. Prepared for Belectric, Inc.
- 2012. Final Environmental Impact Statement: Desert Harvest Solar Electric Generating Facility. Prepared for enXco and the Bureau of Land Management.

- 2012. *Programmatic Environmental Impact Statement for Solar Energy Development in Six Western States.* Argonne National Laboratory and Department of the Interior, Bureau of Land Management.
- O'Rourke, Dan and Matthew Braun. 2012. *NRHP Evaluation of the Intense Pulsed Neutron Source, Argonne National Laboratory*. Department of Energy, Argonne National Laboratory, Argonne, Illinois
- O'Rourke, Dan and Matthew Braun. 2011. *NRHP Evaluation of Five Test Grids, Dugway Proving Ground, Dugway, Utah*. U.S. Army, Dugway Proving Ground, Dugway, Utah.
- Wescott, Konstance, Matthew Braun, Bruce Verhaaren and Robin Burgess. 2010. SAA Poster Presentation: *Cultural Resource Challenges of Utility Scale Renewable Energy Development on Public Lands*. Argonne National Laboratory and Department of the Interior, Bureau of Land Management.
- O'Rourke, Dan and Matthew Braun. 2010. *Phase I Cultural Resources Survey for the Materials Design Laboratory, Argonne National Laboratory, Argonne, Illinois*. Argonne National Laboratory, Lemont, Illinois.

DECLARATION OF
Thomas Gates

I, : Thomas Gates

1. I am presently employed by the California Energy Commission in the Cultural Resources Unit, Environmental Protection Office, Siting, Transmission and Environmental Protection Division as an Energy Planner II.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on Cultural Resources, for the Palen Solar Electric Generating System project (09-AFC-7C) based on my independent analysis of the Petition to Amend and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: September 19, 2013 Signed: Thomas Gates

At: Sacramento, California

Thomas M. Gates, Ph.D.
Curriculum Vitae

EDUCATION
University of North Carolina at Chapel Hill, Ph.D., Anthropology, **Chapel Hill, NC 8/95**
Humboldt State University, B.A., Anthropology, B.A., Philosophy, Minor Studio Painting, **Arcata, CA**, **6/87**

NON-ACADEMIC EMPLOYMENT
California Energy Commission, Sacramento, CA, 1/1/12 – Present
Cultural Resources Analyst – Planner II
Work with a team of cultural resources professionals to review and respond to energy facility siting applications proposing energy facility construction or facility amendments located within the State of California. Specifically provide tribal consultation and ethnographic methods expertise.

Preservation Management Services, Sacramento, CA, 9/14/11 – Present
Self-Employed Owner
Secure, perform and complete contract work for tribal, federal, state, and local governments. Work includes following services: Tribal Historic Preservation Office (THPO) program development, operations and related training; THPO Cultural Resources Management Planning and facilitation; Cultural Landscape, traditional Cultural Property and Sacred Site Assessments, Cultural Resources Surveys and Cultural Resources monitor mitigation.

North State Resources, Inc., Sacramento, CA, 11/1/2009 – 11/08/11
Senior Program Manager:
Direct Cultural Resource Program for a team of CRM professionals to secure, perform and complete CRM cultural resource contracts on behalf of diverse client base (government agencies, developers, tribal governments. Also provided services in cultural resources training and tribal government planning facilitation.

SWCA Environmental Consultants, Sacramento, CA, 6/23/08-10/30/09
Senior Program Manager:
Direct Cultural Resource Program for a team of CRM professionals to secure, perform and complete CRM cultural resource contracts on behalf of diverse client base (government agencies, developers, tribal governments). Also provide training for Tribal Historic Preservation Officer (THPO) programs, NHPA Section 106 and Consultation with Indian Tribes.

Yurok Tribe, Klamath, CA, 5/1/03- 6/15/08
Self Governance Officer:
Coordinated Yurok governmental functions with local, state, federal governments; negotiated contracts, compacts, annual funding agreements, memorandums of understanding per the Indian Self Determination Act. More recently, handled tribal land appraisals, acquisitions, land acquisition funding, sustainable forestry management, tribal park planning and youth workforce creation.

Yurok Tribe, Klamath, CA, 9/4/96-6/15/08
Heritage Preservation Officer:
Performed Tribal Heritage Preservation Officer functions for Yurok Tribal Lands per NHPA § 101d(2)NPS Agreement. Provided Section 106 comment and made National Register nominations related to undertakings affecting tribal lands. Coordinated CHRIS Info Center/Tribal Inventory. Reviewed archeology survey reports and site records. Participated in the North Coast Strategic Partnership Coalition.

Yurok Tribe, Klamath, CA, 10/1/93– 5/1/03
Culture Department Director:
Directed a department with four divisions: Archeology, Archives, NAGPRA, Mapping and Compliance. Coordinated Tribal Elder's Cultural Committee, represented the tribe in Federal and State consultations pertaining to Yurok Culture. Managed multi-account program budget ($300,000/year) of base funding, grants and contracts for ethnographic research, archeological survey and monitoring and related planning.

USFS - Inyo NF, Bishop, CA, 6/1/80 – 8/31/89 (Seasonal)
Watershed Restoration Crew Leader/Member:
Supervised summer work-crews performing erosion control, dam construction, trail and road work and trout spawning site restoration in remote wilderness and back country settings; coordinated crew safety program.

ACADEMIC EMPLOYMENT

Humboldt State University, Arcata, CA, 6/1/92 - 5/31/07
Lecturer:
Cultural Anthropology, North American Indians and Anthropology of Religion

College of the Redwoods,Eureka, CA, 8/94-5/98
Adjunct Instructor:
Cultural Anthropology, Archeology, Folklore

University of North Carolina at Chapel Hill, Chapel Hill, NC, 8/1/88-5/31/90
Instructor:
General Anthropology
Teaching Assistant:
General and Cultural Anthropology

RESEARCH and PROJECTS

NSR – Assessing Effects to Indian Trust Resources and Cultural Values as a Result of Implementing the Klamath Basin Settlement Agreement to Remove Four Dams Along the Klamath River. 2010 – 2011. Project manager responsible for facilitating project Sub team (BIA and BOR) tribal consultations with 6 Klamath Basin Tribal governments and owners and heirs of Public Domain Allotments. Project also entails writing a Background Technical Report that assesses historic and current operation effects on trust resources. A final report is also being completed that assesses future operations affects on trust resources for two broad alternatives: "dams in" and "dams out."

SWCA – California Indian Heritage Center, Sacramento, CA, 2008 – 2011
Consult on behalf of California State Parks with tribal entities throughout the State of California in relation to the planning, design and construction of a $50 million facility and grounds located in Sacramento, and representing all California Tribes. Center will feature archaeological collections, archives, education classrooms, botanical gardens and demonstration village along banks of Sacramento River.

Yurok Tribal Park and Homeland Restoration, Klamath, CA, 2003 – 2008
Team Leader:
Coordination, planning, and acquisition for the Yurok Tribe initiative to regain homelands through creation of a tribal park system, marine sanctuary, community forest and related land purchases and transfers.

Yurok Tribe Condor Re-Introduction, Klamath, CA, 2007 – 2008
Principal:
Study of historic and environmental conditions conducive to the re-introduction of condor into Yurok territory.

Tsurai Village Site Management Plan, Trinidad, CA, 2003-2008
Team Leader:
Coordinated document drafting, community scoping, and negotiations leading to the transfer of a Yurok Archaeological site from the City of Trinidad to the Yurok Tribe.

North Coastal Information Center of the CHRIS, Klamath, CA, 2000-2008
Coordinator:
Negotiated, established and coordinated the North Coastal Information Center with CA SHPO; managed archeological and historical records and clearing house; provided review and compliance support for CEQA, Coastal Act, NEPA, NHPA, ARPA and CDF Timber Harvest Rule projects occurring in Humboldt and Del Norte counties.

Bald Hills Ethnographic Landscape Study, Orick, CA, 1999 – 2001
Co-Principal: Yurok Ethnographic use study of Bald Hills, Redwood National and State Parks (RNSP), Interview, field survey and record

Dissertation Fieldwork: Yurok Trail System, Klamath, CA, 1991-1995
Ph.D. Candidate: Compiled a history of Yurok trail systems, obtaining information from ethnographic interviews, literature, cartographic inventories, and archeological surveys.

Origins of the Peruvian Potato Project, Chapel Hill, NC, 1988
Research Assistant: University of North Carolina – Anthropology Lab. Peruvian Weather data entry, analysis – Assessment of trail distances between Andean potato gardens and villages in relation to garden sun exposure.

PUBLICATIONS

Yurok Tribe Comprehensive Cultural Resource Management Plan A 15 Year Plan for the Implementation of the Yurok Tribe - NPS Agreement to perform § 101d(2) functions of NHPA and other cultural resource related Tribal, Federal and State laws.

Along the Ridgelines: The History of Yurok Trail Systems, (Ph.D. Dissertation, UNC), **12/94**

The Asdiwal Myth Complex of the Tsimshian of the N*orthwest Coast of British Columbia* (4th semester paper, UNC), **5/89**

***Watershed Restoration Construction Safety Precautions Watershed Restoration Construction Manual* 6/87,** Inyo National Forest, U.S. Forest Service

APPOINTMENTS

National Association of THPOs – Co-founder and Board member	**1998-2008**
Historic Resource Information Centers of California – President	**1999-00**
Jacoby Creek Land Trust – Board Member and Recording Secretary	**1998-00**

AWARDS

CA State Senator Chesbro - *Recognition of Achievement* – for the passage of the 2002 Native American Historical Resources Protection Act

Research and Teaching Assistantships, UNC Dept. of Anthropology	**1987, 88, 89, 90**
USFS Employee Award – *Outstanding Service in the Field*	**1980, 81, 82, 86**

TRAINING

PSMJ Project Management Bootcamp, Phoenix, Arizona	**2009**

AFFILIATIONS

National Association of Tribal Heritage Preservation Officers
Society for California Archeology
National Trust for Historic Preservation
American Anthropological Association
California State Park Foundation
National Park Conservation Foundation
Smithsonian Institute
American Hiking Society

PERSONAL

Born 1962, Married 1984, two children (born: 1986, 1988)
Hobbies/Recreational Interests: watercolor painting, basketball, backpacking, gardening, landscaping, piano

REFERENCES

Larry Myers, Native American Heritage Commission
Tel: 916 653 3356 Email: lm_nahc@pacbell.net

Bambi Kraus, President, National Association of Tribal Historic Preservation Officers
Tel: 202 628-8476 Email: bambi@nathpo.org

Destry Jarvis, President, Outdoor Recreation and Parks Services Consulting
Tel: 540 338-6970 Email: destryjarvis@earthlink.net

Lynda Roush, Arcata Field Office Director, BLM
Tel: 707 825-2309 Email: Lynda_Roush@ca.blm.gov

Dan Hall, Archaeologist, BIA Sacramento Regional Office
Tel: 916 978-6041 Email: dan.hall@bia.gov

Troy Fletcher, Senior Policy Analyst, Yurok Tribe
Tel: 530 625 4015 Email: troy_fletcher@earthlink.net

Rhea Graham, Program Manager – Klamath River Dams Project, Bureau of Reclamation
Tel: 916 978 5113 Email: rgraham@usbr.gov

DECLARATION OF
Michael D McGuirt

I, : Michael D McGuirt

1. I am presently employed by the California Energy Commission in the Cultural Resources Unit, Environmental Protection Office, Siting, Transmission and Environmental Protection Division as an Energy Planner II.

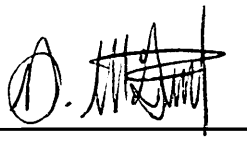
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on Cultural Resources, for the Palen Solar Electric Generating System project (09-AFC-7C) based on my independent analysis of the Petition to Amend and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 9/19/2013 Signed: 

At: Sacramento, California

MICHAEL D MCGUIRT, MA, RPA

SUMMARY OF PROFESSIONAL EXPERIENCE

Over eighteen years of professional academic and cultural resources management experience in western North America, Hawai'i, Central America, and Eastern Europe. Former regulator and present planner with expert knowledge of Section 106 of the National Historic Preservation Act of 1966 (NHPA). Thorough knowledge of the California Environmental Quality Act of 1970, Section 110 of the NHPA, and the US Army Corps of Engineers' Appendix C. Working knowledge of the National Environmental Policy Act of 1969, Native American Graves Protection and Repatriation Act of 1990, and the Archaeological Resources Protection Act of 1979. Expert in developing and coordinating historic preservation solutions that comply with complex Federal, state, and local regulatory environments for large-scale energy, transportation, and telecommunications projects. Expert technical skills in geoarchaeology, mapping and spatial analysis, archaeological survey and excavation, and material culture analyses.

EDUCATION

MASTER OF ARTS, Anthropology, University of Texas at Austin
May 1996

BACHELOR OF ARTS, Anthropology and Archaeological Studies, University of Texas at Austin
December 1990

PROFESSIONAL AFFILIATIONS

Register of Professional Archaeologists
Society for American Archaeology
Society for California Archaeology
National Trust for Historic Preservation
California Preservation Foundation

HONORARY AFFILIATIONS

Honor Society of Phi Kappa Phi

RECENT PROFESSIONAL EMPLOYMENT

ENERGY PLANNER III, California Energy Commission, Sacramento, California
December 2009 to May 2010

Supervised an Energy Commission staff of five professional cultural resources analysts and a varying number of equivalent consultants in the development of CEQA and NEPA analyses of the potential effects that the construction and operation of proposed thermal power plants may have on significant cultural resources, developed and supervised the implementation of agency-wide programs to facilitate agency compliance with Federal historic preservation regulations, and supervised the periodic staff reviews of licensees' actions to ensure compliance with conditions of certification for extant licenses.

ENERGY PLANNER II, California Energy Commission, Sacramento, California
November 2007 to December 2009, June 2010 to present

Develop environmental impact analyses of the potential effects that the construction and operation of proposed thermal power plants may have on significant cultural resources. Apply applicable Federal, State, and local statutes and regulations, as they relate to the consideration of cultural resources. Design and execute cultural resource impact analyses that are appropriate to the specific regulatory context for each proposed project. Gather and evaluate information on projects and on cultural resources in project areas. Develop and maintain agency and public relationships to acquire the most useful data and to elicit input in the development of California Energy Commission conditions of certification. Succinctly convey, orally in different public forums and in different written technical formats, the results of cultural resource impact analyses and proposed conditions of certifications meant to mitigate adverse impacts to significant cultural resources. Periodic reviews of licensees' actions to ensure compliance with extant conditions of certification. Oversight of consultants' who are preparing cultural resource impact analyses.

ASSOCIATE STATE ARCHAEOLOGIST, Office of Historic Preservation, California Department of Parks and Recreation (California State Parks), Sacramento, California
May 2001 to November 2007

Regulator, in the California Office of Historic Preservation (OHP), of the Advisory Council on Historic Preservation's (Advisory Council) process implementing Section 106 of the National Historic Preservation Act (NHPA). Conducted among the most complex Section 106 reviews, and participated in, and often guided, the consultations of which those reviews were a part. Formally advised other OHP units and the California State Historical Resources Commission on the appropriate disposition and treatment of archaeological resources in the context of other State and Federal historic preservation programs that OHP either administers or in which OHP participates. Worked out of class for two consecutive, six-month terms as a Senior State Archeologist, from December 2004 through December 2005, supervising the Project Review Unit for the State Historic Preservation Officer (SHPO). As the Acting Chief of Project Review, managed and trained a staff of eight professionals and one clerical assistant to conduct, on behalf of the SHPO, the review of all Federal agency actions in the State of California under 36 CFR Part 800, the Advisory Council's Section 106 regulation.

ENVIRONMENTAL SPECIALIST III, Jones & Stokes, Sacramento, California
February 1999 to May 2001

Designed, conducted, and managed short- and long-term archaeological projects in California, Nevada, and New Mexico to comply with Sections 106 and 110 of the NHPA. Prepared proposals. Assisted with client contract negotiations. Conducted archaeological record searches and archival research. Directed Phase I pedestrian inventory surveys and test excavations for Phase II evaluations. Analyzed material culture assemblages. Prepared technical reports and regulatory compliance documents including National Register property and district evaluations, and monitoring and discovery plans. Represented clients in consultations with federal and state agencies, and coordinated and managed clients' compliance with federal cultural resource

regulations and the cultural resource regulations of California, Nevada, and New Mexico.

ASSISTANT ANTHROPOLOGIST, Bernice Pauahi Bishop Museum, Honolulu, Hawai`i
August 1996 to June 1998

Assisted with archaeological project design, preparation of proposals, and client contract negotiations, directed Phase I pedestrian inventory surveys, test excavations for Phase I subsurface inventory surveys, test excavations for property evaluations, and data recovery excavations, and assisted with preparation of technical reports on short-term cultural resource management contracts. Analyzed field records, prepared site reports and synthetic report chapters, and analyzed and prepared reports on lithic assemblages for Phases I–III of a long-term federal highway project (Interstate Route H–3). Conducted research in Hawaiian archaeology, and delivered public and professional presentations of that research. Advised on the integration of geoarchaeological methods and techniques into cultural resource management field efforts, and on geoarchaeological interpretations of extant field records, and designed and conducted geoarchaeological components of fieldwork for short–term cultural resource management contracts.

ARCHEOLOGIST I, Archeology Survey Team, Texas Parks and Wildlife Department, Austin, Texas
December 1994 to May 1995

Assisted in the direction of pedestrian inventory surveys, the preparation of cultural resource management plans, and the preparation of state site forms and reports of investigations. Advised on the integration of global positioning system (GPS) technology and the field methods of archaeological survey.

ARCHAEOLOGIST, Lower Colorado River Authority, Austin, Texas
February 1994 to December 1994

Designed and implemented experimental mitigation measures for archaeological sites subject to fluvial and lacustrine erosion. Assisted in pedestrian inventory surveys and evaluation-phase excavations, the preparation of State site forms, the development of the agency's database for its archaeological site inventory, and public education initiatives that included site tours for primary and secondary students, and workshops with field and classroom components to instruct primary and secondary teachers.

RECENT PROFESSIONAL DEVELOPMENT

CULTURAL RESOURCE AND ENVIRONMENTAL LAW

The Section 106 Advanced Seminar: Reaching Successful Outcomes in Section 106 Review
Sacramento, California, Advisory Council on Historic Preservation, Tom McCulloch
March 2011

Renewable Energy Development: Impacts on Cultural Resources
Phoenix, Arizona, National Preservation Institute, Claudia Nissley
February 2011

Thresholds of Significance in Environmental Planning
Sacramento, California, University of California, Davis, Continuing and Professional Education, Terry Rivasplata and Maggie Townsley
February 2011

Successful CEQA Compliance: An Intensive Two-Day Seminar
Sacramento, California, University of California, Davis, Continuing and Professional Education, Terry Rivasplata and Maggie Townsley
June 2009

ACHP - FHWA Advanced Seminar: Reaching Successful Outcomes in Section 106 Review
Vancouver, Washington, Advisory Council on Historic Preservation, Don Klima and Carol Legard; Federal Highway Administration, Mary Ann Naber
October 2007

NEPA Compliance and Cultural Resources
Portland, Oregon, National Preservation Institute, Joe Trnka
October 2007

Section 106: How to Negotiate and Write Agreements
Sacramento, California, National Preservation Institute, Claudia Nissley
November 2004

Consultation with Indian Tribes on Cultural Resource Issues
Sacramento, California, National Preservation Institute, Thomas F. King and Reba Fuller
September 2003

Section 106: How to Negotiate and Write Agreements
The Presidio, San Francisco, California, National Preservation Institute, Thomas F. King
May 2002

Introduction to CEQA
Sacramento, California, University of California, Davis, Continuing and Professional Education, Ken Bogdan and Terry Rivasplata
July 2000

TECHNICAL ARCHAEOLOGY

Introduction to Historic Site Survey, Preliminary Evaluation, and Artifact ID
West Sacramento, California, California Department of Transportation, Julia Huddleson, Anmarie Medin, Judy Tordoff, and Kimberly Wooten; California Department of Parks and Recreation, Glenn Farris, Larry Felton, and Pete Schulz
September 2006

Principles of Geoarchaeology for Transportation Projects (Course No. 100246)
Sacramento, California, California Department of Transportation, Graham Dalldorf, Glenn Gmoser, Jack Meyer, Stephen Norwick, Adrian Praetzellis, and William Silva
October 2006

INFORMATION TECHNOLOGY AND CULTURAL RESOURCE MANAGEMENT

GIS: Practical Applications for Cultural Resource Projects
Sacramento, California, National Preservation Institute, Deidre McCarthy
September 2006

ENVIRONMENAL ANALYSES, TECHNICAL REPORTS, CONFERENCE PAPERS, AND PUBLICATIONS

ALLRED, SARAH, MICHAEL MCGUIRT, AND KATHLEEN FORREST

2010 **Cultural Resources and Native American Values**. In *Calico Solar Power Project, Supplemental Staff Assessment, Part II* (CEC-700-2010-009-SSA-2, August 2010), edited by Siting, Transmission and Environmental Protection Division, California Energy Commission, pp. C.2-1–C.2-175. Siting, Transmission and Environmental Protection Division, California Energy Commission, Sacramento. On file with the California Energy Commission, Sacramento.

BASTIAN, BEVERLY E. AND MICHAEL D. MCGUIRT

2009 **Cultural Resources**. In *Final Staff Assessment, Canyon Power Plant, Application for Certification (07-AFC-9), Orange County* (CEC-700-2009-008-FSA, September 2009), edited by Siting, Transmission and Environmental Protection Division, California Energy Commission, pp. 4.3-1–4.3-51. Siting, Transmission and Environmental Protection Division, California Energy Commission, Sacramento. On file with the California Energy Commission, Sacramento.

BLOSSER, AMANDA, MICHAEL D. MCGUIRT, AND BEVERLY E. BASTIAN

2008 **Cultural Resources**. In *Staff Assessment, Orange Grove Project, Application for Certification (08-AFC-4), San Diego County* (CEC-700-2008-009, November 2008), edited by Siting, Transmission and Environmental Protection Division, California Energy Commission, pp. 4.3-1–4.3-43. Siting, Transmission and Environmental Protection Division, California Energy Commission, Sacramento. On file with the California Energy Commission, Sacramento.

DARCANGELO, JENNIFER, JOHN SHARP, MICHAEL D. MCGUIRT, ANDREA GALVIN, AND CLARENCE CAESAR

2004 ***Section 106 for Experienced Practitioners: Consulting with the California SHPO*** *(GEV4111)*. Course taught on 8 September 2004 in Oakland to California Department of Transportation cultural resources personnel and private sector cultural resource consultants (8 hours).

DARCANGELO, JENNIFER, JOHN SHARP, MICHAEL D. MCGUIRT, AND ANDREA GALVIN

2005 ***How to Consult with the California SHPO***. Workshop presented on 23 April 2005 at the 39th Annual Meeting of the Society for California Archaeology, Sacramento, California (6 hours).

FORREST, KATHLEEN AND MICHAEL D. MCGUIRT

2010 **Cultural Resources**. In *Almond 2 Power Plant Project, Revised Staff Assessment* (CEC-700-2010-011REV, July 2010), edited by Siting, Transmission and

Environmental Protection Division, California Energy Commission, pp. 4.3-1–4.3-51. Siting, Transmission and Environmental Protection Division, California Energy Commission, Sacramento. On file with the California Energy Commission, Sacramento.

GATES, THOMAS, AMBER GRADY, AND MICHAEL D. MCGUIRT

2012 **Cultural Resources**. In *Hidden Hills Solar Electric Generating System (11-AFC-2) Supplemental Staff Assessment* (June 15, 2012), pp. 1–101. Siting, Transmission and Environmental Protection Division, California Energy Commission, Sacramento. On file with the California Energy Commission, Sacramento.

JONES & STOKES

1999a ***Cultural Resource Inventory Report for Williams Communications, Inc. Fiber Optic Cable System Installation Project, Wendover, Nevada to the California State Line***. Volume 1: Draft Report. July. (JSA 98-358.) Sacramento, California. Prepared for Williams Communications, Inc., Tulsa, Oklahoma.

1999b ***Cultural Resources Report for the Williams Communications, Inc. Interstate 80 Fiber Optic Cable System Installation Project***. Volume I. September. (JSA 98-358.) Submitted to Williams Communications, Inc., Tulsa, Oklahoma. On file with the State Historic Preservation Office, Carson City, Nevada.

1999c ***Archaeological Site Avoidance and Monitoring Plans for Williams Communications' Fiber Optic Cable Installation In the Union Pacific Railroad Right-of-Way, Doña Ana County to Hidalgo County, New Mexico***. October. (JSA98-379.) Sacramento, California. Prepared for Williams Communications, Inc., Tulsa, Oklahoma.

2001 ***Final Phase II Cultural Resource Evaluation for the Kramer Mining District, Edwards AFB, Kern and San Bernardino Counties, California***. Volume I. November. Sacramento, California. On file with the Base Historic Preservation Officer, Edwards AFB, California.

LEBO, SUSAN A. AND MICHAEL D. MCGUIRT

1997 ***Geoarchaeology at 800 Nuuanu: Archaeological Inventory Survey of Site 50-80-14-5496 (TMK1-7-02:02), Honolulu, Hawai`i***. Department of Anthropology, Bishop Museum, Honolulu. (100 pp.) Submitted to Bank of Hawaii, Honolulu. On file with the State Historic Preservation Division, Honolulu.

1998a ***Assessments of Stone Architecture: a Case Study from North Hālawa Valley, O`ahu***. Paper presented at the 11th Annual Hawaiian Archaeology Conference of the Society for Hawaiian Archaeology, Kailua-Kona, Hawai`i.

1998b ***Pili Grass, Wood Frame, Brick, and Concrete: Archaeology at 800 Nuuanu***. Department of Anthropology, Bishop Museum, Honolulu. (142 pp.) Submitted to Bank of Hawaii, Honolulu. On file with the State Historic Preservation Division, Honolulu.

LENNSTROM, HEIDI A., P. CHRISTIAAN KLIEGER, MICHAEL D. MCGUIRT, AND SUSAN A. LEBO

1997 ***Archaeological Reconnaissance of Pouhala Marsh, `Ewa District, O`ahu***. Department of Anthropology, Bishop Museum, Honolulu. (14 pp.) Submitted to Ducks Unlimited, Inc., Rancho Cordova, California. On file with the State Historic Preservation Division, Honolulu.

MCGUIRT, MICHAEL D.

1996 ***The Geoarchaeology and Palynology of an Early Formative Pithouse Village in West-Central New Mexico***. Unpublished M.A. thesis, Department of Anthropology, University of Texas at Austin.

1998 **50-80-10-2010, 50-80-10-2016, 50-80-10-2088, and 50-80-10-2134**. In *Activities and Settlement in an Upper Valley: Data Recovery and Monitoring Archaeology in North Hālawa Valley, O`ahu*, vols. 2a and 2b, edited by Department of Anthropology, Bishop Museum, pp. 1–3, 1–44, 1–5, and 1–46. Department of Anthropology, Bishop Museum, Honolulu. Submitted to State of Hawaii, Department of Transportation, Honolulu. On file with the State Historic Preservation Division, Honolulu.

2002 **Committee Reports, OHP Liaison**. *SCA Newsletter* 36(3):4–5.

2004 **Committee Reports, OHP Liaison**. *SCA Newsletter* 38(2):7, 38(3):6–8.

2006 **Preservation Archaeology**. In *California Statewide Historic Preservation Plan: 2006–2010*, edited by Marie Nelson, pp. 8–15. California Department of Parks and Recreation's Office of Historic Preservation, Sacramento. Submitted to the National Park Service, Washington, D.C. On file at the California Office of Historic Preservation, Sacramento.

2007 **Dealing with Multi-element Cultural Resources under Section 106**. In *Historic Properties Are More Than Meets the Eye: Dealing with Historical Archaeological Resources under the Regulatory Context of Section 106 and CEQA*. Session presented on 25 April 2008 at the *33rd Annual California Preservation Conference* of the California Preservation Foundation in Napa, California, moderated by Michelle Messinger and Michael D. McGuirt (1 1/2 hours).

2010 **Cultural Resources and Native American Values**. In *Imperial Valley Solar Project (Formerly SES Solar Two), Supplemental Staff Assessment, Part II* (CEC-700-2010-013 SUP, August 2010), edited by Siting, Transmission and Environmental Protection Division, California Energy Commission, pp. C.3-1–C.3-409 plus appendix B (118 pp.). Siting, Transmission and Environmental Protection Division, California Energy Commission, Sacramento. On file with the California Energy Commission, Sacramento.

2012 **[Geology and geomorphology contexts (pp. 4.3-12–4.3-15), and discussions of geoarchaeological field investigations and the role of the investigations in the regulatory process (pp. 4.3-39–4.3-43)]** In *Rio Mesa Solar Electric Generating Facility, Preliminary Staff Assessment-Part B* (CEC-700-2012-006-PSA-PTB, October 2012), edited by Siting, Transmission and Environmental Protection Division, California Energy

Commission. Siting, Transmission and Environmental Protection Division, California Energy Commission, Sacramento. On file with the California Energy Commission, Sacramento.

MCGUIRT, MICHAEL D., AMANDA BLOSSER, AND BEVERLY E. BASTIAN

2009 **Cultural Resources**. In *Final Staff Assessment, Beacon Solar Energy Project, Application for Certification (08-AFC-2), Kern County* (CEC-700-2009-005-FSA, August 2009), edited by Siting, Transmission and Environmental Protection Division, California Energy Commission, pp. 4.3-1–4.3-131. Siting, Transmission and Environmental Protection Division, California Energy Commission, Sacramento. On file with the California Energy Commission, Sacramento.

MCGUIRT, MICHAEL D., THOMAS GATES, AND AMBER GRADY

2012 **Cultural Resources, Sandy Valley Off-site Alternative, Alternatives**. In *Hidden Hills Solar Electric Generating System (HHSEGS), Preliminary Staff Assessment* (CEC-700-2012-003-PSA, May 2012), edited by Siting, Transmission and Environmental Protection Division, California Energy Commission, pp. 6.1-25–6.1-32. Siting, Transmission and Environmental Protection Division, California Energy Commission, Sacramento. On file with the California Energy Commission, Sacramento.

MCGUIRT, MICHAEL D. AND LESLIE H. HARTZELL

1997 **50-80-10-2139 and 50-80-10-2459**. In *Imu, Adzes, and Upland Agriculture: Inventory Survey Archaeology in North Hālawa Valley, O`ahu*, vols. 2c and 2d, edited by Department of Anthropology, Bishop Museum, pp. 1–17 and 1–5. Department of Anthropology, Bishop Museum, Honolulu. Submitted to State of Hawaii, Department of Transportation, Honolulu. On file with the State Historic Preservation Division, Honolulu.

1998 **Chapter 1: Introduction**. In *Activities and Settlement in an Upper Valley: Data Recovery and Monitoring Archaeology in North Hālawa Valley, O`ahu*, vol. 1, edited by Department of Anthropology, Bishop Museum, pp. 1–14. Department of Anthropology, Bishop Museum, Honolulu. Submitted to State of Hawaii, Department of Transportation, Honolulu. On file with the State Historic Preservation Division, Honolulu.

MCGUIRT, MICHAEL D. AND SHANNON P. MACPHERRON

1998 **50-80-10-2137**. In *Activities and Settlement in an Upper Valley: Data Recovery and Monitoring Archaeology in North Hālawa Valley, O`ahu*, vol. 2b, edited by Department of Anthropology, Bishop Museum, pp. 1–86. Department of Anthropology, Bishop Museum, Honolulu. Submitted to State of Hawaii, Department of Transportation, Honolulu. On file with the State Historic Preservation Division, Honolulu.

MCGUIRT, MICHAEL AND SARAH C. MURRAY

2008 **Cultural Resources**. In *Preliminary Staff Assessment, Ivanpah Solar Electric Generating System, Application for Certification (07-AFC-5), San Bernardino County* (CEC-700-2008-013-PSA, December 2008), edited by Siting, Transmission and Environmental Protection Division, California Energy Commission, pp. 5.3-1–5.3-73. Siting, Transmission and Environmental Protection Division, California Energy Commission, Sacramento. On file with the California Energy Commission, Sacramento.

MCGUIRT, MICHAEL D. AND DEBORAH I. OLSZEWSKI

1997 **50-80-10-2256**. In *Imu, Adzes, and Upland Agriculture: Inventory Survey Archaeology in North Hālawa Valley, O`ahu*, vol. 2d, edited by Department of Anthropology, Bishop Museum, pp. 1–9. Department of Anthropology, Bishop Museum, Honolulu. Submitted to State of Hawaii, Department of Transportation, Honolulu. On file with the State Historic Preservation Division, Honolulu.

MIKESELL, STEPHEN, MICHAEL MCGUIRT, AND TRISH FERNANDEZ

2008 **Introduction to the White Papers in State Historical Resources Commission Archaeology Committee White Papers**. *SCA Newsletter* 41(1):18–21.

SHARP, JOHN, MICHAEL D. MCGUIRT, JENNIFER DARCANGELO, AND ANDREA GALVIN

2004 ***How to Consult with the California SHPO***. Workshop presented on 18 March 2004 at the 38th Annual Meeting of the Society for California Archaeology, Riverside, California (4 hours).

DECLARATION OF
Melissa E. Mourkas

I, Melissa E. Mourkas, declare as follows:

1. I am presently employed by the California Energy Commission in the Cultural Resources Unit, Environmental Protection Office, Siting, Transmission and Environmental Protection Division as an Energy Planner II.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on Cultural Resources, for the Palen Solar Electric Generating System project (09-AFC-7C) based on my independent analysis of the Petition to Amend and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

   I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: September 20, 2013 Signed: _____

At: Sacramento, California

MELISSA MOURKAS, ASLA

EDUCATION

MASTER OF ARTS, LANDSCAPE DESIGN & PLANNING, 1994
CONWAY SCHOOL OF LANDSCAPE DESIGN, CONWAY, MASSACHUSETTS

Graduate landscape design program providing professional training in site design and land-use planning. Curriculum emphasis is on sustainable landscape planning and design. Graduate projects included: Master Plan for a 45-acre historic resort, original landscape designed by F.L. Olmsted and Performance Standards for a proposed industrial park.

BACHELOR OF ARTS, HISTORY OF ARCHITECTURE & ART, 1981
SCRIPPS COLLEGE, CLAREMONT, CALIFORNIA

Major studies in Art and Architectural History, Urban Development. Senior thesis: documentation and analysis of the innovative residential designs and construction techniques of California modern architect Rudolf M. Schindler. Minor studies in Art and the Humanities.

PROFESSIONAL EXPERIENCE/QUALIFICATIONS

- Licensed Landscape Architect, California # 5139
- Qualified Architectural Historian, Secretary of the Interior's Standards for Historic Preservation, Code of Federal Regulations, 36 CFR Part 61.
- Chair, City of Sacramento Preservation Commission

LANDSCAPE ARCHITECTURE:

1994 to Present: Landscape Architecture and Design. Experience in landscape architecture, landscape construction estimating, site planning, historic landscapes and landscape master plans. Provide landscape architecture and consulting services to private clients, public organizations, contractors, and design firms. Preparation of Cultural Landscape Reports. Frequent speaker to various groups on landscape design, construction and cultural landscapes. Owner of Landscape Legacy, established 1998.

PLANNING AND HISTORIC PRESERVATION:

April 2010 to Present: Planner II, California Energy Commission, Siting, Transmission and Environmental Protection Division. Provide technical environmental analysis of proposed energy facilities and development. Review of EIR/EIS documents prepared by other agencies under NEPA. Specific tasks include: the assessment of potential impacts of new electric power plants on both Visual and Cultural Resources; identification of suitable mitigation measures under CEQA; preparation of written testimony; participation in public workshops; present sworn testimony during evidentiary hearings, and project monitoring to ensure compliance with local, state and federal environmental laws and regulations. Cultural Resource specialty in the built environment, including buildings, structures, trails, parks and water conveyance systems.

2005 to 2008: Assistant Planner, Historic Preservation Office, City of Sacramento, CA
Responsible for design review and approval for private and public development projects involving rehabilitation, preservation and restoration of historic resources and districts under CEQA. Prepared staff reports for Preservation Commission and Council, and coordinated with other planning staff on concurrent entitlements. Staff liaison on municipal development projects involving historic resources, including buildings, other structures, parks and roadways.

PALEN SOLAR ELECTRIC GENERATING SYSTEM (09-AFC-7C)
FINAL STAFF ASSESSMENT – Part B
Amendment to Palen Solar Power Project

PREPARATION TEAM

Executive Summary ..... Christine Stora

Introduction ..... Christine Stora

~~Project Description ..... Christine Stora~~

Environmental Assessment

~~Air Quality ..... Jacquelyn Leyva Record~~

~~Biological Resources ..... Ann Crisp, William B. Haas, Chris Huntley, Nick Lancaster and Carol Watson~~

Cultural Resources ..... Matthew Braun, Thomas Gates, Michael McGuirt and Melissa Mourkas

~~Hazardous Materials Management ..... Alvin Greenberg, Ph.D.~~

~~Land Use ..... James Adams~~

~~Noise and Vibration ..... Shahab Khoshmashrab~~

~~Public Health ..... Huei-An (Ann) Chu, Ph.D.~~

~~Socioeconomics ..... Lisa Worrall~~

~~Soil and Water Resources ..... Marylou Taylor, P.E.~~

~~Traffic and Transportation ..... David Flores, Alvin Greenberg, Ph.D., Gregg Irvin, Ph.D., Andrea Koch and Geoff Lesh, PE~~

~~Transmission Line Safety and Nuisance ..... Obed Odoemelam, Ph.D.~~

~~Visual Resources ..... Gregg Irvin, Ph.D. and William Kanemoto~~

~~Waste Management ..... Christopher Dennis, PG~~

~~Worker Safety and Fire Protection ..... Alvin Greenberg, Ph.D.~~

~~**Engineering Assessment**~~

~~Facility Design ..... Shahab Khoshmashrab~~

~~Geology and Paleontology ..... Casey Weaver, CEG~~

~~Power Plant Efficiency ..... Edward Brady~~

~~Power Plant Reliability ..... Edward Brady~~

~~Transmission System Engineering ..... Mark Hesters and Laiping Ng~~

~~**Alternatives** ..... Jeanine Hinde and Steven Kerr~~

~~**Compliance Conditions and Compliance Monitoring Plan** ..... Eric Veerkamp~~

Project Assistant ..... Alicia Campos