



BrightSource

DOCKET

11-AFC-2

DATE SEP 23 2011

RECD. SEP 23 2011

September 23, 2011

Mike Monasmith
Project Manager
Systems Assessment & Facility Siting Division
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, CA 95814

SUBJECT: Supplement B to the Application for Certification
Hidden Hills SEGS (11-AFC-2)

Dear Mr. Monasmith:

Hidden Hills Solar I, LLC, and Hidden Hills Solar II, LLC, collectively the "Applicant" for the Hidden Hills Solar Electric Generating System project ("HHSEGS"), are pleased to provide the attached Supplement ("Supplement B") in response to the Data Adequacy Review of the Application for Certification for HHSEGS.

The discussions with the Commission's Staff regarding Data Adequacy have been productive. Given the information set forth in the Application, the Supplement submitted on September 7, 2011 ("Supplement A"), and this Supplement B, the Applicant respectfully submits that the information required by Appendix B of the Commission's Regulations is before the Commission. We believe the Application is Data Adequate.

We look forward to a finding of Data Adequacy on October 5, 2011 that will allow this important solar project to move forward. Thank you for your time and consideration.

Sincerely,

Clay Jensen
Senior Director of Project Development

Supplement B

Hidden Hills

Solar Electric Generating System



Application for Certification
Hidden Hills Solar I, LLC; and Hidden Hills Solar II, LLC

September 2011

With Technical Assistance from



Supplement B

Response to Data Adequacy Review

of the

Application for Certification

for the

**Hidden Hills Solar Electric
Generating System
(HHSEGS)**

(11-AFC-02)

Submitted to the

California Energy Commission

Submitted by

**Hidden Hills Solar I, LLC,
and Hidden Hills Solar II, LLC**

September 2011

CH2MHILL

2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833

Contents

AFC Section	Page
Introduction.....	1
5.2 Biological Resources.....	3
5.3 Cultural Resources	19

Tables

5.2-14R	Agency Contacts for Biological Resource
B1-1	Cultural Chronologies Proposed for the Mojave Desert
B2-1	Archaeological Sites Recorded and Evaluated within HHSEGS Study Area
B3-1	Archaeological Sites Evaluated for the CRHR

Attachments

B1	AFC Figures 5.2-1 and 5.2-2 (Submitted under separate cover)
B2	Updated Wetland Delineation Maps (Submitted under separate cover)
B3	CNDDB Records
B4-1	Records of Conversation
B4-2	Burrowing Owl Field Survey Forms

Introduction

This Supplement to the Hidden Hills Solar Electric Generating System (HHSEGS) Application for Certification (AFC) (11-AFC-02) responds to comments the California Energy Commission (CEC) Staff have made as a result of their data adequacy review of the AFC. The intention of this Supplement is to provide all additional information necessary for Staff to find that the AFC contains sufficient and adequate data to begin a power plant site certification proceeding under Appendix B of Title 20, California Code of Regulations and the Warren-Alquist Energy Resources Conservation and Development Act.

The format for this Supplement follows the order of the AFC sections and provides additional information and responses to CEC information requests on Biological Resources, and Cultural Resources. Only sections for which CEC Staff posed requests or questions related to data adequacy are addressed in this supplement. If the response calls for additional appended material, it is included at the end of each subsection.

Each subsection contains data adequacy questions or information requests, with numbers and summary titles and, in brackets, the citation from Appendix B, Title 22, California Code of Regulations (*Regulations Pertaining to the Rules of Practice and Procedure and Power Plant Site Certification*) indicating a particular information requirement for the AFC. Each item follows with the CEC Staff comment on data adequacy for this item, under the heading “Information required for the AFC to conform with regulations” followed by the Applicant’s response to the information requested.

5.2 Biological Resources

B1. Sensitive Biological Resources Map [Appendix B(g)(13)(A)]

A regional overview and discussion of terrestrial and aquatic biological resources, with particular attention to sensitive biological resources within ten (10) miles of the project. Include a map at a scale of 1:100,000 (or other suitable scale) showing sensitive biological resource location(s) in relation to the project site and related facilities and any boundaries of a local Habitat Conservation Plan or similar open space land use plan or designation. Sensitive biological resources include the following:

Information required for the AFC to conform to the regulations:

Please provide a map at 1:100,000 scale of ~~sensitive biological resources~~ within 10 miles of the project site and related facilities and any boundaries of a local Habitat Conservation Plan or similar open space land use plan or designation. Please provide the following information for a regional overview map: NEMO regional management layers, Clark County HCP layer, the Nopah Wilderness Area, South Nopah Wilderness Area, and Pahrump Wilderness Area.

Response- AFC Figures 5.2-1 and 5.2-2 have been reprinted at the 1:100,000 scale with the requested information added. They have been renumbered as 5.2-1R and 5.2-2R. Five sets of the figures are being provided to CEC staff as Attachment B1. Electronic copies will be provided to others upon request.

B2. Delineated Wetlands Map [Appendix B(g)(13)(B)(iii)]

An aerial photo or wetlands delineation maps at a scale of (1:2,400) showing any potential jurisdictional and non-jurisdictional wetlands delineated out to 250 feet from the edge of disturbance if wetlands occur within 250 feet of the project site and/or related facilities that would be included with the US Army Corps of Engineers (USACE) Section 404 Permit application. For projects proposed to be located within the coastal zone, also provide aerial photographs or maps as described above that identify wetlands as defined by the Coastal Act.

Information required for the AFC to conform to the regulations:

Please provide maps a scale of 1:2,400 showing any potential jurisdictional and non-jurisdictional wetlands delineated out to 250 feet from the edge of disturbance if wetlands occur within 250 feet of the project site and/or related facilities that would be included with the US Army Corps of Engineers (USACE) Section 404 Permit application. Provide an aerial photos or wetland delineation maps of jurisdictional and nonjurisdictional waters of the U.S. that occur beyond the project site to conform to the delineation out to the 250 foot buffer beyond the project boundary.

Response- Although these maps were provided in the initial September 2011 Data Adequacy submittal, there was a printing error and the delineation information for the 250-foot buffer was not clearly displayed. Five new sets of the drawings have been reprinted and the corrected maps are being provided to CEC staff as Attachment B2. Electronic copies will be provided to others upon request. The wetland delineation of

the 250-buffer and construction laydown area was delineated using the same methodology as described in Section 3 of the Jurisdictional Delineation Report (AFC Appendix 5.2E)

B3. CNDDDB Records & Field Survey Forms; Qualifications of Biologists [Appendix B(g)(13)(D)]

A description and results of all field studies and seasonal surveys used to provide biological baseline information about the project site and associated facilities. Include copies of the California Natural Diversity Database records and field survey forms completed by the applicant's biologist(s). Identify the date(s) the surveys were completed, methods used to complete the surveys, and the name(s) and qualifications of the biologists conducting the surveys. Include:

Information required for the AFC to conform to the regulations:

*~~Have UTM coordinates for sensitive species encountered in Appendix 5.2F. Please provide verification that field forms and maps have been provided to the CNDDDB. Please provide copies of the CNDDDB field survey forms for sensitive species occurrences found during surveys. Also include CNDDDB field forms for the Nye milkvetch (*Astragalus nyensis*) since this species is new to California~~*

Response- Copies of the wildlife and special-status plant CNDDDB forms (including Nye milkvetch) are provided as Attachment B3. Nye milkvetch does not have special status but we inserted information from the surveys into a CNDDDB form to comply with this request.

B4. Protocol Surveys [Appendix B(g)(13)(D)(i)]

Current biological resources surveys conducted using appropriate field survey protocols during the appropriate season(s). State and federal agencies with jurisdiction shall be consulted for field survey protocol guidance prior to surveys if a protocol exists;

Information required for the AFC to conform to the regulations:

~~Regarding golden eagle, Attachment BR-4 provides an explanation from CDFG BHS biologist (Jeff Villepique) on conflicts with eagle helicopter surveys and bighorn sheep lambing season; however, contact with USFWS Migratory Bird Program staff, the primary federal agency regulating eagle surveys and permitting, was not provided in this attachment of the Supplement. Since submitting the Supplement, the applicant did contact and provide a record of conversation with USFWS Regional Eagle Permit Biologist (Heather Beeler, dated Sept 7, 2011). Protocol surveys were not conducted for western burrowing owl and golden eagle. Please follow survey protocol guidance from Pagel 2010 for golden eagle and California Burrowing Owl Consortium 1993 for western burrowing owl. Regarding burrowing owl, the applicant performed owl surveys concurrently with desert tortoise surveys, but did not provide any data that Phase II or Phase III surveys were performed (CBOC 1993). Please provide field survey data forms for burrowing owl surveys have been conducted to date; include specific survey dates and times surveys were conducted on these forms. Please provide an assessment of potential impacts to roosting and foraging habitat for bats. Subsequent golden eagle surveys will be requested during Data Discovery phase in order to conform to the federal survey protocol (Pagel et al. 2010). Burrowing owl surveys may also be requested during Data Discovery. Please also contact USFWS BHS biologists for CA and NV for their input on golden eagle survey protocol guidance in relation to timing with BHS lambing season and provide record of conversation.~~

Response

- a. A copy of the record of conversation with Heather Beeler, dated September 7, 2011 is provided in Attachment B4-1. Ms. Beeler concurred with the plan to conduct helicopter surveys outside of the nesting season, to identify nest sites, and to follow with two pedestrian surveys during the nesting season. She stated that the helicopter survey, although outside of the nesting season, would be useful, especially considering the limitations on pedestrian surveys due to the terrain of the area. She said that a contact for Golden Eagle permits has not been identified in USFWS Nevada.
- b. Phase I burrowing owl habitat assessment was part of the Pre-field Investigation and Occurrence Potential (AFC Section 5.2.5.6.1). The Phase II Burrow Survey was conducted between April 13 2011 and May 18, 2011. Survey information is provided in the survey report (AFC, Appendix 5.2F). Field survey forms for burrowing owls are provided as Attachment B4-2.
- c. Nelson's Bighorn Sheep in the vicinity of the project are not part of the Federally designated Distinct Population Segment (DPS) peninsular nelson's bighorn sheep that is listed as Endangered under the Endangered Species Act. The most northern extent of their range is more than 150 miles away, near Palm Springs, California. Hence, USFWS does not have a BHS biologist.

Records of conversation with the California and Nevada USFWS biologists about timing of golden eagle surveys are included in Attachment B4-1. Also included is a Record of Conversation with Brad Hardenbrook with the Nevada Department of Wildlife. Brad Novosak, Nevada USFWS biologist, suggested that Pat Cummings with the Nevada Department of Wildlife be contacted regarding this issue. However, Mr. Hardenbrook (Mr. Cummings supervisor) had already been contacted.

B5. Air Emission Impacts [Appendix B(g)(13)(E)(i)]

all impacts (direct, indirect, and cumulative) to biological resources from project site preparation, construction activities, plant operation, maintenance, and closure. Discussion shall also address sensitive species habitat impacts from cooling tower drift and air emissions;

Information required for the AFC to conform to the regulations:

Please provide a discussion of potential impacts to biological resources from plant closure. Please address the project's impacts to the following biological resources: special status plant species, ~~Nelson's bighorn sheep spring foraging habitat, desert kit fox, golden eagle, and special status bats~~, state waters, ~~and the effects of the power tower and other structures to avian species.~~

Please include a discussion on the project's direct, indirect, and cumulative impacts from project site preparation, construction activities, plant operation, maintenance, and closure to special-status plant species, desert kit fox and state waters since they were not addressed in the AFC or supplement. Include a discussion of impacts of the storm water management system on state waters.

Response

a. Direct, Indirect and Cumulative Impacts to Special Status Plants

Eight special-status plants, as defined in the AFC, were identified onsite. None of the eight are federally or state-listed (California) as threatened, endangered, or rare. Construction of the HHSEGS site would result in direct temporary or permanent impacts to the eight special-status plant species (as shown in Table 5.2-11 of the AFC) located within the site boundary. These localities would either be displaced by project elements or temporarily or permanently affected during construction and operation of the project. Special-status plants located in the 250-foot site buffer potentially could be indirectly affected by construction.

A summary of the species that potentially could be directly or indirectly affected by the proposed project is provided below.

Pink-funnel lily:

- Onsite – 352 individuals in 66 locations
- 250-foot buffer – 88 individuals in 24 locations
- Total for Pink-funnel lily – 440 individuals in 90 locations

Preuss' milkvetch:

- Onsite – 4 individuals in 2 locations
- 250-foot buffer – 3 individuals in 1 location
- Total for Preuss' milkvetch – 7 individuals in 3 locations

Tidestrom's milkvetch:

- Onsite – 3,134 individuals in 74 locations
- 250-foot buffer – 248 individuals in 20 locations
- Total for Tidestrom's milkvetch – 3,382 individuals in 94 locations

Wheeler's skeletonweed:

- Onsite – 783 individuals in 56 locations
- 250-foot buffer – 408 individuals in 29 locations
- Total for Wheeler's skeletonweed – 1,191 individuals in 85 locations

Purplenerve springparsley:

- Onsite – 1 individual in 1 location
- 250-foot buffer – this species was not observed in the site buffer
- Total for Purplenerve springparsley – 1 individual in 1 location

Pahrump Valley buckwheat:

- Onsite – 15,000 individuals (estimated) in 57 locations
- 250-foot buffer – 346 individuals in 11 locations
- Total for Pahrump Valley buckwheat – 15,346 individuals in 68 locations

Goodding's phacelia:

- Onsite – 27,706 individuals in 232 locations
- 250-foot buffer – 6,227 individuals in 65 locations
- Total for Goodding's phacelia – 33,933 individuals in 297 locations

Desert wing-fruit:

- Onsite – 63 individuals in 13 locations
- 250-foot buffer – this species was not observed in the site buffer
- Total for Desert wing-fruit – 63 individuals in 13 locations

In addition to the eight special-status plant species Nye milkvetch was identified in onsite and in the 250-foot buffer.

Nye milkvetch:

- Onsite – 4,859 individuals in 162 locations
- 250-foot buffer – 2,368 individuals in 34 locations
- Total for Nye milkvetch – 7,227 individuals in 196 locations

Nye milkvetch was first identified in California during these surveys. These localities of Nye milkvetch potentially could also be directly affected by construction or operation of the proposed project.

Focused offsite surveys were also conducted in 2011 within portions of Inyo County, and in the southern Pahrump, Chicago, and Stewart valleys in California and Nevada, nearby the HHSEGS site. Special-status plant localities were identified during the offsite surveys described in Section 5.2.2.5 of the AFC. All of the species found onsite were also identified during the offsite surveys. Prior to these surveys, areas near the HHSEGS site had not been extensively botanized, and few records of special-status plants exist from these locations. Results of the offsite surveys substantially increases the number of special-status plant occurrences in the project region and expands the previously known distributions of many of these special-status plant species. Results of offsite surveys will be provided in a separate report, which should be available before the end of October 2011 (GANDA 2011c, in preparation).

The direct and indirect impacts to these eight special-status plants could potentially be significant without avoidance (resulting from the use of a taller solar power tower, thus minimizing the project footprint) as contemplated by the project's design. As the Applicant has discussed with Staff, the Applicant looks forward to working together to further refine reasonable and feasible strategies to minimize project impacts. For a discussion of potential mitigation measures for special status plants, please see response B7, below.

Cumulative Impacts to Special-Status Plants

As described in the AFC, seven other future projects are located in the vicinity of the HHSEGS. These seven projects are not considered reasonably foreseeable because they have not moved forward in the development process to the point where sufficient information is publicly available to determine if their impacts, when combined with the proposed project's impacts, would result in significant adverse cumulative impacts. Each of the projects as they are permitted would be required to mitigate for any significant impacts that may result from their project actions so that the impacts are reduced to levels that are less than significant, both individually and cumulatively, in consideration of all other projects in the Pahrump Valley area. Because HHSEGS has advanced to the point where it is reasonably foreseeable, if any of those other projects should move forward, the HHSEGS project will be part of the "environmental baseline"

for the environmental analyses of those other projects; that is, CEQA requires that those potential future projects would have to consider the presence of HHSEGS in their environmental analyses and mitigate, accordingly. For these reasons, the cumulative effects of the HHSEGS project are less than significant.

b. Direct, Indirect and Cumulative Impacts to Desert Kit Fox

The desert kit fox (*Vulpes macrotis*) is not a state or federally listed species. A different subspecies, the San Joaquin subspecies (*V. macrotis mutica*) is restricted to the San Joaquin Valley and adjacent valleys in California and is listed as endangered under the California Endangered Species Act, but does not occur on the site or in the project vicinity. The nearest populations of the listed subspecies occur in western Kern County on and around the Elk Hills near Bakersfield, approximately 175 miles away.

However, the desert kit fox enjoys some statutory protection. Per Title 14, California Fish and Game Code, Section 460 (14 CFGC 460), it may not be taken at any time. Avoidance measures are developed in consultation with the California Department of Fish and Game (CDFG) on a project-specific basis. If, during pre-construction surveys, occupied dens are encountered when pups are present, then a buffer and an access corridor to foraging habitat may be established and maintained until the pups leave the den. At other times of the year, vacant dens may be hand excavated and collapsed. A Record of Conversation with Craig Bailey, CDFG, is included in Attachment B4-1.

Changes in canid communities, including extirpation of the wolf (*Canis lupus*) from many areas and the increase in coyote (*C. latrans*) populations, and the recent range expansion of the red fox (*Vulpes vulpes*), have had negative consequences for kit foxes. Coyotes are likely a major cause of mortality of kit foxes. Although coyote predation on kit foxes can be severe, red foxes may pose an even greater threat to kit fox populations because of their greater ecological overlap and potential for competition.

Direct impacts to the desert kit fox could occur in the form of denning and foraging habitat loss.

Cumulative effects will be the same for this species as for other biological resources analyzed in AFC Section 5.2.8.2, Cumulative Effects to Biological Resources, and are less than significant. The amount of habitat lost will be *de minimus*, given the vast areas of surrounding habitats.

c. Direct, Indirect and Cumulative Impacts to State Waters

Sixty-nine desert ephemeral streams, occupying 13.9 acres of the HHSEGS site, were delineated within the project boundary (URS, 2011; Hidden Hills Ranch Solar Project-Approved Jurisdictional Determination (Final), May 6, 2011, included in the AFC filing as Appendix 5.2E). Flows within the ephemeral drainages infiltrate quickly in coarse textured soils as the slope gradient diminishes from east to west; average slope is less than one percent (URS 2011). Several of the washes exhibit a braided or anastomose morphology and often interconnect with other nearby washes either by natural forces or by following earthen roadways that form a grid over the site (URS 2011).

Traditionally, the U.S. Army Corps of Engineers (USACE) has interpreted Clean Water Act (CWA) regulations to define "waters of the United States" within non-tidal waters,

in the absence of adjacent wetlands, as defined by the ordinary high water mark (OHWM). Generally, the USACE has considered the OHWM to be the elevation to which water flows at a 2-year frequency (i.e., 50 years out of 100 years), and has asserted jurisdiction over waters demonstrating these characteristics, including ephemeral washes.

More recently, the USACE has published *"A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States"* (USACE 2008; see also USACE 2006). This field methodology has been developed by USACE for delineating OHWM in the arid west region of the western United States. It presents methodology that is generally consistent with earlier guidance documents (specifically Guidelines for Jurisdictional Determinations for Waters of the United States in the Arid Southwest [USACE, 2001]), with the exception that OHWM indicators could be associated with 5-year events within the arid west, rather than the 2-year events that is applied in other, more temperate climates.

The updated methodology also puts a greater emphasis on changes in vegetation and sediment size in identifying jurisdictional limits. USACE jurisdiction being limited to areas with an OHWM, while areas of sheet flow, swales with infrequent drainage, or even larger drainages that only flow in extreme events would normally not be considered jurisdictional waters of the U.S. under the CWA.

A jurisdictional determination from USACE was requested on May 6, 2011, but has not been received on the project. However, there is some indication that the USACE may find a subset of the 13.9 acres identified in the URS delineation to be jurisdictional. Based on discussions with the USACE, during the wetland delineation verification site visit in August 2011, the USACE believes that three of the surface drainages could be federally jurisdictional. Further, it is important to note that those desert washes that are not considered to be waters of the U.S., would likely be considered "waters of the State" for the purposes of the Commission's processing of this AFC. (See Record of Conversation with Jeff Brandt, CDFG, included in Attachment B4-1).

Impacts to Wetlands and State/Federal Waters

The project would likely have direct impacts on any waters of the state from construction activities such as the installation of the drive zones and "spoke roads" and both internal and external perimeter roads. The internal roadway and utility corridors for each heliostat field and its power block will contain a 20-foot-wide paved or hardscape access road from the entrance of the solar plant site to the power block, and then around the power block.

In addition to the paved or hardscaped 20-foot-wide access road to the power block of each unit, unpaved roads will radiate out from the power block to provide access through the solar field to the internal perimeter access road. Within the heliostat fields, 20-foot wide "drive zones" will be located concentrically around the power block to provide access to the heliostat mirrors for maintenance and cleaning (see AFC Figure 2.1-2). The drive zones will be located approximately 152 feet apart and will be grubbed to remove vegetation and smoothed. A 12-foot-wide unpaved path will be constructed on the inside perimeter of the project boundary fence for use by HHSEGS

personnel to monitor and maintain perimeter security and tortoise exclusion fencing. These paths will be grubbed, bladed, and smoothed to facilitate safe use with minimal grading where necessary to cross washes.

Construction activities, including vegetation clearing and grading, would likely result in alteration, rerouting, fill, and loss of some of the existing 13.9 acres of ephemeral washes in the project footprint. Features most likely to be affected are the small, weakly expressed ephemeral washes that lack defined bed and bank characteristics. Following construction, annual stormwater will free-flow across the entire site with the exception of the power block areas, the substation, and the administration and storage building. Water diversion berms between 3 to 6.5 feet high would be constructed along the western side of the power block structures with funnel depressions along each end that will channel flows impinging on the berm into drainage ditches that will discharge back into the solar field downstream of the power block corners. As needed during operations, accumulated sediment and debris along the perimeter fence will be removed to ensure fence integrity and to maintain natural drainage across the site.

Based upon the wetland delineation maps, construction of the power blocks, substation, and administration building are not likely to result in the permanent loss of ephemeral washes since the washes fan out into sheet flow before reaching these structures. Additional construction activities such as installation of the natural gas lines, placement of gen-tie lines, and construction of drive zones, will result in temporary disturbance and a small amount of additional impacts to the washes onsite.

The heliostat fields, which comprise the vast majority of the project footprint, will not require grading for foundations, diversion berms or other substantial earthwork, since sheet flow across the project site remains the objective. Operation and maintenance of the heliostat mirrors would require vehicle access between every other row to wash the mirrors on a regular basis. Less frequent access would be necessary for maintenance and vegetation clearing. These activities would involve driving through existing drainages and also through drainages that have reformed due to natural processes.

Construction and operation of the facility are not likely to result in a substantive loss of ephemeral washes or a change in the drainage patterns or hydrology of the site because of the large number of washes that are expected to naturally reform. The temporary and permanent loss of ephemeral drainages is therefore not considered to be a significant biological resource impact. Construction and operation may require permits from the CDFG and the USACE and RWQCB on matters of federal law and these permits may have special conditions; however, replacement of lost ephemeral wash habitat is typically not required. BMPs, as listed in the project SWPPPs, will be implemented during project construction and operation.

Cumulative Impacts to Wetlands and Other Waters

Grazing, off-road recreational activities, and construction of transmission lines, facilities, and roads near the Calvada Springs community have contributed to the cumulative degradation of biological resources and wetlands in the area. Of the 69 desert washes that were identified at the project site, only one was found to extend all the way across the project site. None of the 69 desert washes were found to have any connectivity to

relatively permanent waterways or traditional navigable waterways, including Pahrump Playa, located approximately 2 miles from the terminus of the closest desert wash (URS, 2011). Since the project will be designed so that stormwater sheetflows across the site, stormwater from the project site will not combine with flows from adjacent development to create a cumulative impact. As a result, the cumulative effects are less-than-significant.

References

United States Army Corps of Engineers (USACE). 2001. Final Summary Report: Guidelines for Jurisdictional Determinations for Waters of the U.S. in the Arid Southwest. June.

USACE. 2006. Distribution of Ordinary High Water Mark (OHWM) Indicators and Their Reliability in Identifying the Limits of "Waters of the United States" in Arid Southwestern Channels. Cold Regions Research and Engineering Laboratory. Authors: R.W. Lichvar, D.C. Finnegan, M.P. Ericsson, and W. Ochs. February.

USACE. 2008a. A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States. Cold Regions Research and Engineering Laboratory. Authors: R.W. Lichvar and S.M. McColley. August.

United States Environmental Protection Agency (USEPA). 2003. Federal Register Volume 68. Number 10. Appendix A, Joint Memorandum (provides guidance regarding the Supreme Court's rulemaking on "SWANCC"). January 15.

URS. 2011. Approved Jurisdictional Determination Report. Hidden Hills Ranch Solar Project. Inyo County, California. Submitted to Mr. Bruce Henderson US Army Corps of Engineers. North Coast Branch, Regulatory Division, Ventura, CA. Submitted by: BrightSource Energy Inc. Report Prepared by: URS Corporation. Tucson, Arizona 85705. May 6.

B6. Off-site Habitat Mitigation [Appendix B(g)(13)(F)(ii)]

All off-site habitat mitigation and habitat improvement or compensation, and an identification of contacts for compensation habitat and management;

Information required for the AFC to conform to the regulations:

- a. ~~Only addresses desert tortoise.~~ Please provide a discussion of the need for compensatory mitigation regarding ~~western burrowing owl~~, special-status plants, ~~Nelson's bighorn sheep foraging habitat~~, desert kit fox, ~~golden eagle foraging habitat~~, ~~special status bats~~, and state waters.*

Please address compensatory mitigation necessary to lessen the project's impacts to biological resources to less-than-significant levels.

As most of the special-status plants are at least a CNPS List 2 and one is a List 1B, compensatory mitigation needs to be discussed as avoidance and minimization measures may not lessen impacts to less-than-significant levels.

As state waters will be impacted by construction of the power blocks, switchyard, buildings, and storm water management system, please address compensatory mitigation necessary to lessen impacts to state waters to less-than-significant levels.

Response – If impacts to special-status plants or state waters are determined to be significant, and mitigation is required, the mitigation approach will be developed in coordination with the resources agencies. Various types of mitigation could be adequate to offset impacts, for example, an in-lieu program may be established in the future, or funds could be used towards the purchase of conservation lands. It is also possible that any lands purchased for desert tortoise compensation could also be “nested” to be used for special status plant mitigation. See also the discussion of mitigation in response B7, below.

b. Please contact and identify USFWS and CDFG personnel regarding compensatory mitigation.

Response – The USFWS and CDFG have identified the appropriate personnel as follows: Ray Bransfield (USFWS) and Bruce Kinney (CDFG). Their contact information has been added to the agency list (see response to B9, below). Copies of the records of conversation with CDFG and USFWS staff are provided in Attachment B4-1.

B7. Monitoring Compliance Effectiveness [Appendix B(g)(13)(G)]

A discussion of compliance and monitoring programs to ensure the effectiveness of impact avoidance and mitigation measures incorporated into the project.

Information required for the AFC to conform to the regulations:

Please provide a discussion of proposed mitigation effectiveness monitoring for desert tortoise, western burrowing owl, special-status plants, Nelson’s bighorn sheep foraging habitat, kit fox, golden eagle foraging habitat, special status bats, state waters, and impacts to avian species from the power tower and other structures. For special-status plants, please provide a description of potential mitigation measures that may be considered to protect these plant species and monitoring plans to help determine if the mitigation is successful.

Response – If mitigation for special-status plant impacts at the HHSEGS is required, appropriate mitigation measures will be developed in coordination with the resource agencies. Possible mitigation measures that will be discussed with the resource agencies, and rationale for inclusion, are described below.

A general discussion of approaches to avoidance and minimization strategies is discussed below. Please also note that while the Applicant is providing details on possible mitigation strategies, it is done with the understanding that the Applicant does not believe that the project’s potential impacts are significant as that term of art is used in CEQA. Applicant looks forward to working with Staff on these issues.

Three of the special-status plants identified onsite are annuals (Pahrump Valley buckwheat, Goodding’s phacelia, and desert wing-fruit). Nye milkvetch, which does not have special-status, and was first documented in California during surveys of the HHSEGS site, is also an annual species. Annual species complete their lifecycle within a single year, and persist over the long-term as a seed bank. Seed may germinate in future years with favorable rainfall. The remaining five special-status plants are short-lived

perennial herbaceous species, meaning the plants live more than a single year, but they die back seasonally to the ground. These species are: pink-funnel lily, Preuss' milkvetch, Tidestrom's milkvetch, Wheeler's skeletonweed, and purplenerve springparsley.

Within the site, the solar power towers in the center of each solar field will be approximately 750 feet tall to allow for more efficient land use and more electrical generation per acre. This is an effective avoidance measure. The taller towers substantially reduce the project's footprint compared to a shorter solar power tower that would require greater acreage, and would result in greater loss of special-status plants. This productivity improvement design feature requires spacing between the heliostat rows that will be too narrow to accommodate the amount of fenced area required for long-term survival of special-status plants in the heliostat field. Fencing around plants within the heliostat array is therefore not considered practicable.

Because the three annual special-status plants will not germinate in exactly the same location each year, fencing of the annual special-status plants is not a viable protection measure. It is possible that the special-status annuals onsite will germinate and grow from the existing onsite seed bank following the completion of construction, but this cannot be determined with certainty. Five of the special-status plants onsite are short-lived perennials. Salvage and replanting (transplantation and translocation) of perennial plants in the desert is disfavored by some (CNPS, 2010). With the exception of pink-funnel lily, which is a bulb, salvage and translocation of the short-lived perennial herbaceous special-status species onsite is not recommended. If salvaged, pink-funnel lily bulbs could be replanted in the 250-foot buffer, or on nearby BLM lands, but only if permission to do so is granted by BLM.

To minimize impacts to special-status plants in the 250-foot site buffer, signs will be posted adjacent to special-status plant localities within the buffer, so that they can be avoided by work crews during construction, operation, and closure. These signs will be highly visible and contain the words "sensitive biological resource."

Other possible mitigation measures for special-status plants include payment of an *in-lieu* fee to a conservation organization towards lands acquisition or management of lands that contain localities of the special-status plants found onsite.

Collection of seed from special-status plant localities onsite may also be conducted, if rainfall conditions are favorable and adequate seed is produced in the year preceding construction. Collected seed may be donated to botanical herbaria, provided to conservation or land management organizations, or placed into long-term storage at the Rancho Santa Ana botanical garden, or other seed storage facility for possible future use by conservation organizations.

A Biological Resource Mitigation, Implementation and Monitoring Plan (BRMIMP) will be prepared. The BRMIMP would include, among other elements, a description of the Special-Status Plant Worker Environmental Awareness Program (WEAP) that will be developed to train personnel on the identification of and avoidance measures pertaining to special-status plants.

These mitigation measures could be used individually or in combination, depending upon the extent of the potential impacts and the discussions between the resource

agencies and the Applicant. To the extent feasible, mitigation measures for different potential impacts may be “nested.” For example, mitigation for desert tortoise may also provide mitigation for potential impacts on plant, animals, or state or federal waters.

Reference

California Native Plant Society (CNPS). 2010. *Recommendations of Independent Science Advisors (ISA) for the California Desert Renewable Energy Conservation Plan (ISA Report)*. Letter to David Harlow, Director, and Michael Valentine, Assistant Director. September 14, 2010. Available online at:
http://www.drecp.org/documents/comments_independent_science/

B8. Contact with State & Federal Agencies regarding Permits [Appendix B(g)(13)(H)]

Submit copies of any preliminary correspondence between the project applicant and state and federal resource agencies regarding whether federal or state permits from other agencies such as the U. S. Fish and Wildlife Service (USFWS), the National Marine Fisheries Service (NMFS), the U.S. Army Corps of Engineers (USACE), the California Department of Fish and Game (CDFG), and the Regional Water Quality Control Board (RWCB) will be required for the proposed project.

Information required for the AFC to conform to the regulations:

Please contact CDFG field office in Bishop regarding the need for a Lake and Streambed Alteration Agreement and 2081 permit (but for the exclusive authority of the Energy Commission) and the Ventura Field Office for the USFWS regarding the need for Section 7 consultation for the project which occurs in California. Provide record of conversation with the appropriate CDFG LSAA staff regarding regional mapping methods and criteria for state waters. Please provide a copy of any record of conversation and/or letter the applicant has sent to these agencies regarding the proposed project and any response to these communications.

Response – The Ms. Wendy Campbell of the Bishop field office of CDFG was contacted. She informed the Applicant that she was no longer assigned to that area. The Applicant, then contacted her supervisor, Mr. Bruce Kinney, Deputy Regional Manager. Because we had not heard from Mr. Kinney, the Applicant contacted Jeff Brandt, CDFG, Senior Environmental Scientist, Inland Desert Region to get an idea of CDFG’s position. He recommended being conservative and assuming that CDFG would take jurisdiction over all of the drainages, not just the few we believe may be regulated by the Army Corps. Copies of the Records of Conversation are provided in Attachment B4-1.

B9. Agency Contact Info [Appendix B(i)(2)]

The name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and also provide the name of the official who will serve as a contact person for Commission staff.

Information required for the AFC to conform to the regulations:

Please update Table 5.2-14 to include CDFG Bishop field office contact for the project, (Wendy Campbell, 760-872-1171) and provide USFWS Ventura Field Office biologist contacts for the project. Please include USFWS personnel who work on golden eagle, big horn sheep, and migratory bird issues.

Response – Table 5.2-14 has been updated to include the CDFG Bishop Field Office and the USFWS Field Office. Please note that Wendy Campbell is no longer the CDFG biologist assigned to the HHSEGS project. The Applicant has requested the name of the CDFG Staff person who will ultimately be assigned to the project. In the interim, contact information for Bruce Kinney, Department Regional Manager has been provided until further information is received.

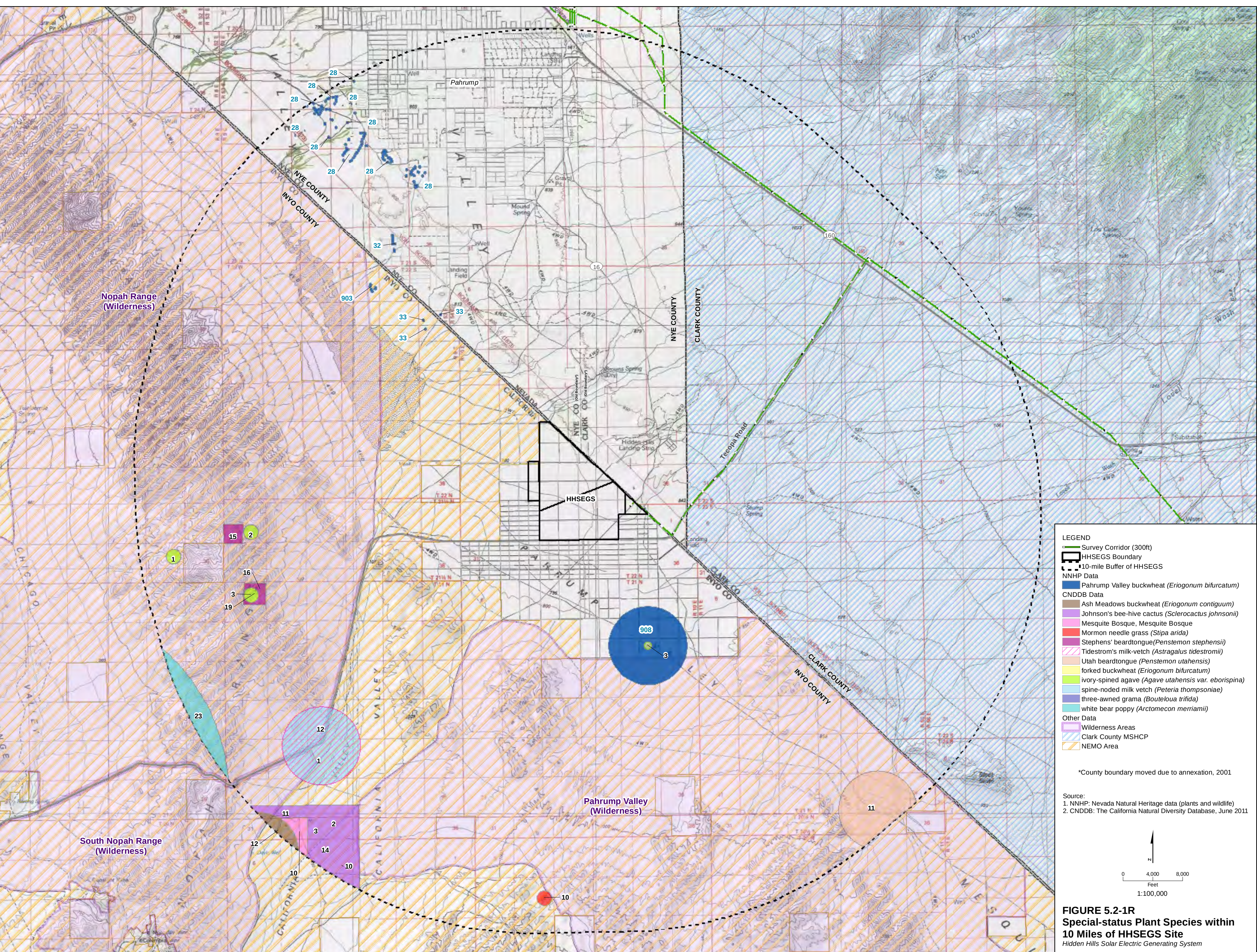
TABLE 5.2-14R
Agency Contacts for Biological Resources

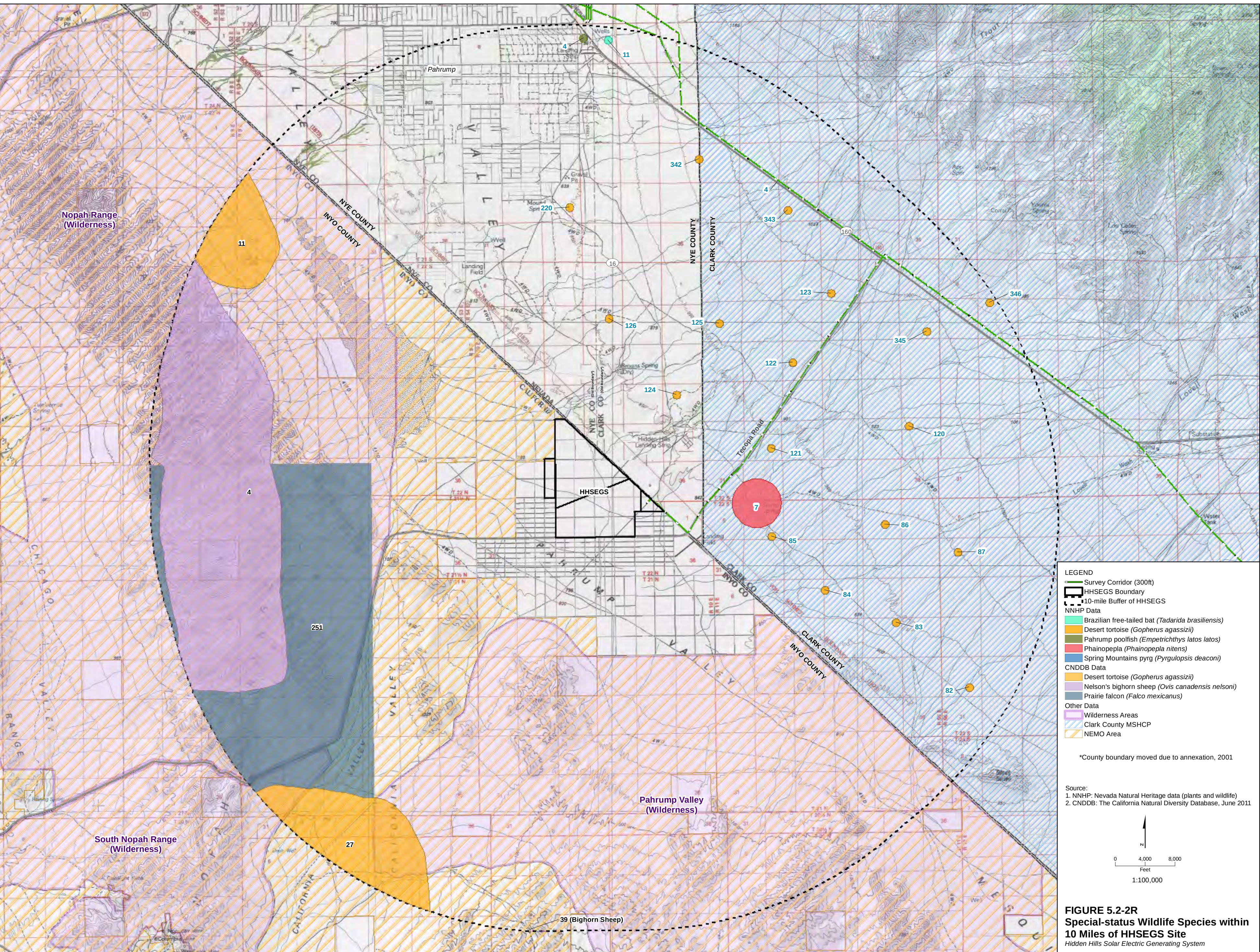
Issue	Agency	Contact
Federal threatened and endangered species – section 7 consultation; biological surveys	U.S. Bureau of Land Management	Jayson Barangan, Wildlife Biologist 4701 North Torrey Pines Drive Las Vegas, NV 89130 (702) 515-5094
	Golden Eagle Surveys	William Quillman, Supervisory Resource Management Specialist Christopher Otahal, Wildlife Biologist 2601 Barstow Road Barstow, CA 92311 (760) 252-6033
Federal threatened and endangered species – section 7 consultation; biological surveys	U.S Fish and Wildlife Service	
	Golden Eagle	Brian Novosak 4701 North Torrey Pines Drive Las Vegas, Nevada 89130 (702) 515-5495
	Bighorn Sheep	Marcy Haworth 1340 Financial Blvd., Suite 234 Reno, Nevada 89502 (775) 861-6300
	Migratory Bird Issues	Heather Beeler Regional Eagle Permit Biologist 2800 Cottage Way Sacramento, CA (916) 414-6464
	Section 7 Consultation Desert Kit Fox	Ray Bransfield 2493 Portola Road, Suite B Ventura, CA 93003 Phone: (805) 644-1766 ext. 317
California threatened and endangered species – CDFG 2081; Streambed Alteration Agreement – CDFG 1600; biological surveys	California Department of Fish and Game Golden Eagle Desert Kit Fox LSAA	Bruce Kinney 407 W. Line Street Bishop, CA 93514 Phone: (760) 872-1129
Nevada Department of Wildlife Bighorn Sheep Golden Eagle	Nevada Department of Wildlife Bighorn Sheep Golden Eagle Kit Fox	Brad Hardenbrook Nevada Department of Wildlife 4747 Vegas Dr. Las Vegas, NV 89108 Phone: (702) 486-5127

TABLE 5.2-14R
Agency Contacts for Biological Resources

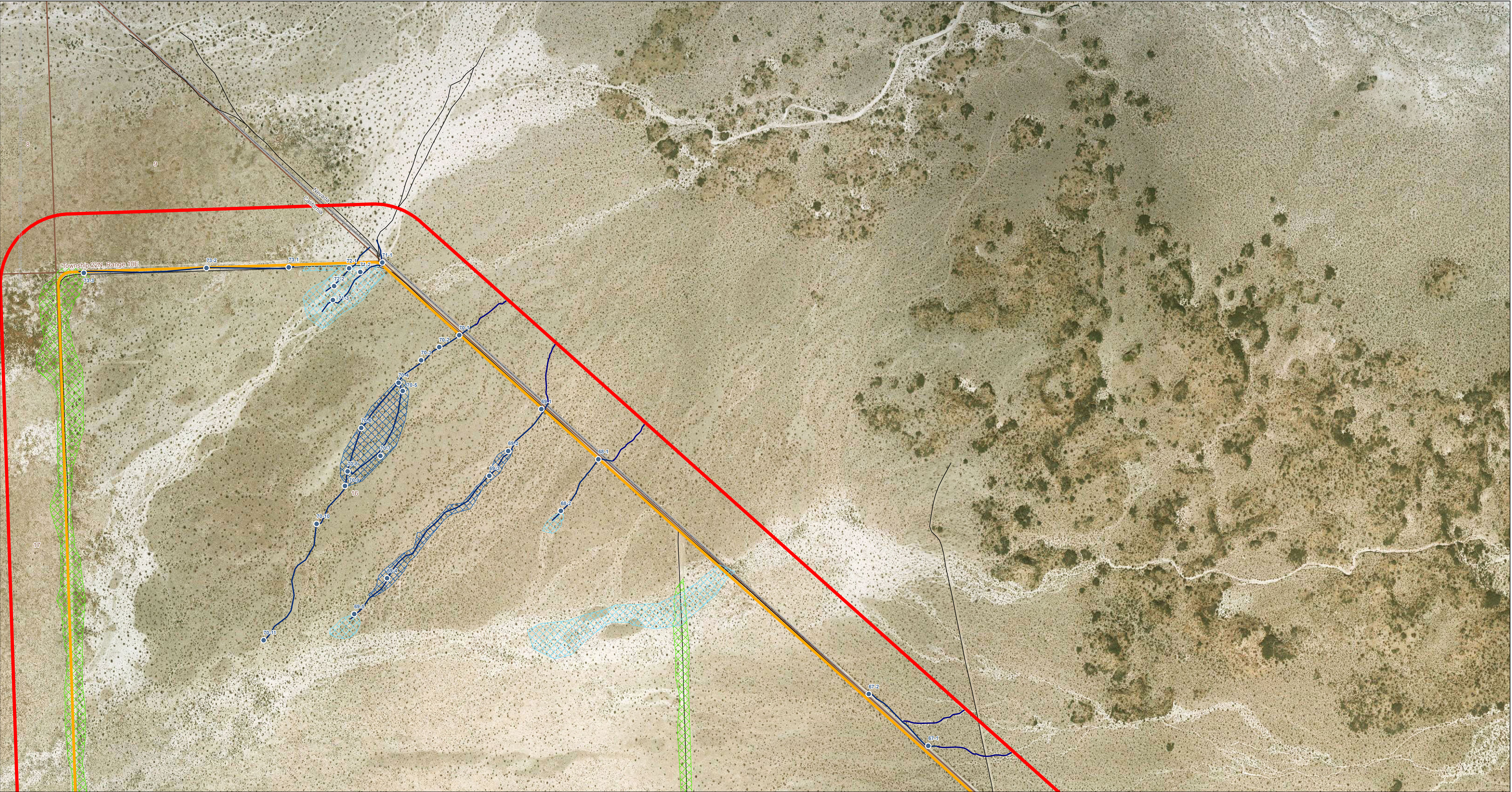
Issue	Agency	Contact
CWA 404 Permit; wetland delineations	U.S. Army Corps of Engineers	Bruce Henderson 2493 Portola Rd., Suite B Ventura, CA 93003 (805) 644-1766
CWA 401 Permit; Porter-Cologne Act, wetland delineations, waste discharge requirements	Lahontan Regional Water Quality Control Board	2501 Lake Tahoe Boulevard South Lake Tahoe, CA 96150-7704 (530) 542-5400

Attachment B1
Figures 5.2-1R and 5.2-2R



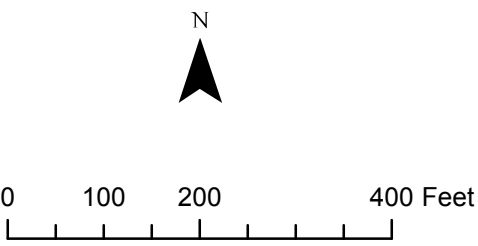


Attachment B2
Wetland Delineation Figures



- Legend**
- 250-ft Buffer of Project Area
 - Project Boundary
 - Temporary Construction Area
 - Photographic Point
 - Ephemeral Desert Wash
 - Anastomose Desert Wash
 - Sheet Flow Area
 - Pooling Area
 - Pooling Area - Moist
 - Road From Aerial
 - Section Boundary
 - State Boundary

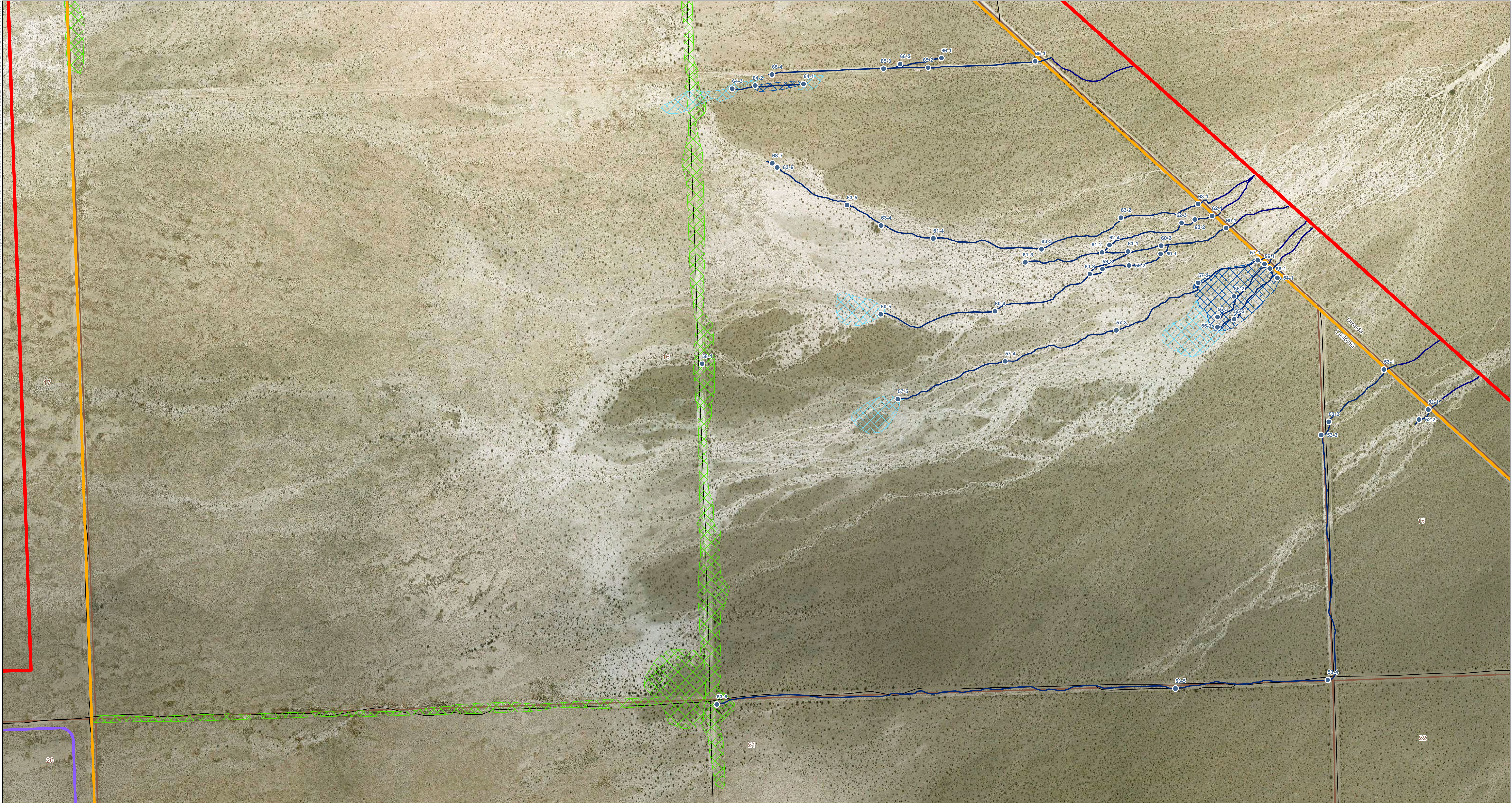
Source:
Aerial Imagery: VTN 2010
Project Boundary: VTN 2010
Wash Data: URS Corporation 2010 - 2011
Wash Features: URS Corporation 2011
Photographic Points: URS Corporation 2011



Map Panel Guide

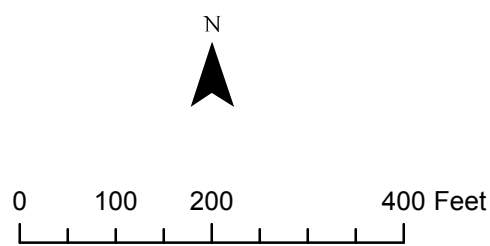
Sheet 2 of 11		
3	4	
5	6	
7	8	9
10	11	

Appendix C
Delineation Map
Bright Source Energy Hidden Hills Ranch
Jurisdictional Delineation



- Legend**
- 250-ft Buffer of Project Area
 - Project Boundary
 - Temporary Construction Area
 - Photographic Point
 - Ephemeral Desert Wash
 - Anastomose Desert Wash
 - Sheet Flow Area
 - Pooling Area
 - Pooling Area - Moist
 - Road From Aerial
 - Section Boundary
 - State Boundary

Source:
Aerial Imagery: VTN 2010
Project Boundary: VTN 2010
Wash Data: URS Corporation 2010 - 2011
Wash Features: URS Corporation 2011
Photographic Points: URS Corporation 2011

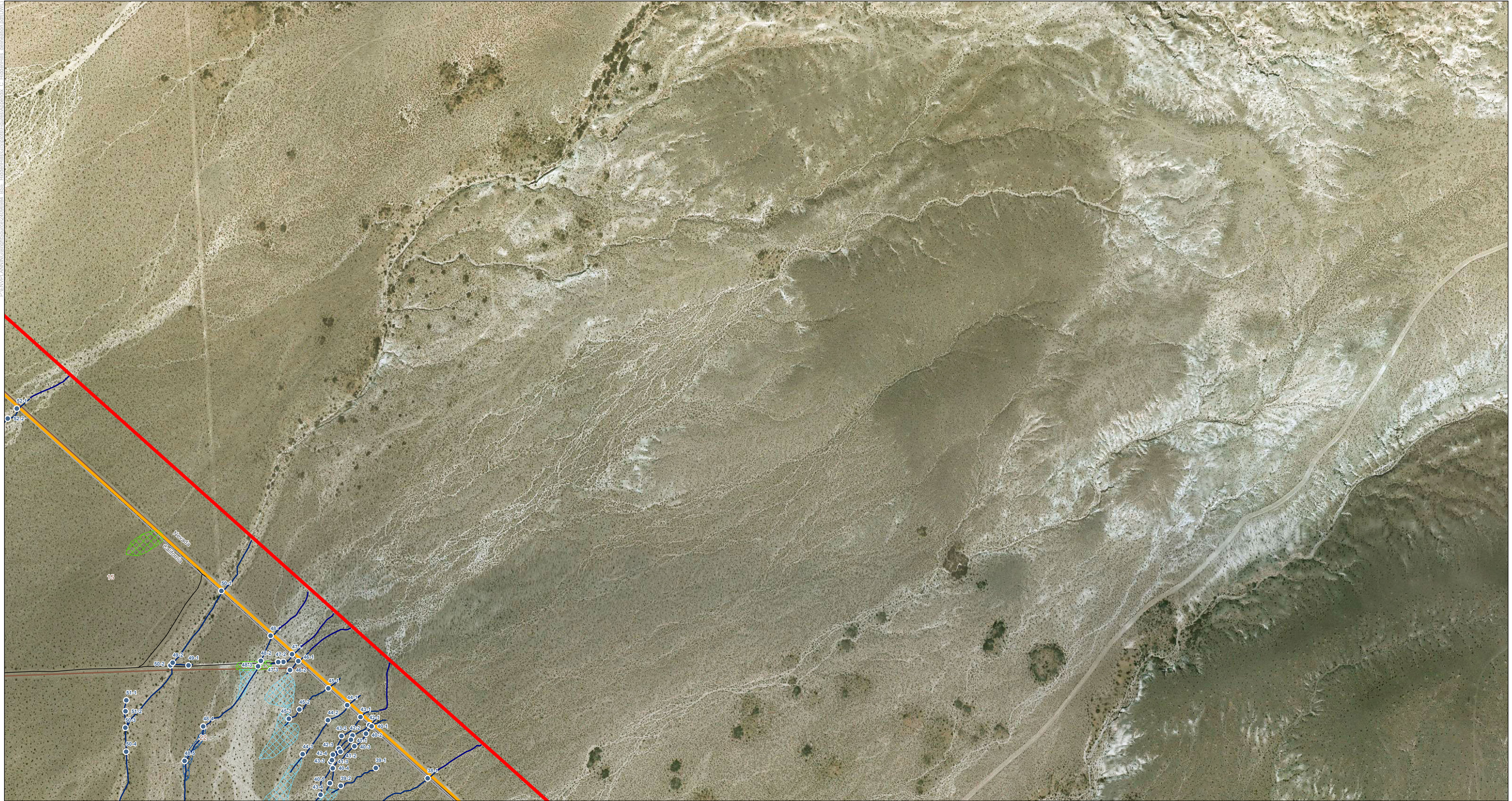


Map Panel Guide

2		
Sheet 3 of 11	4	
5	6	
7	8	9
10	11	

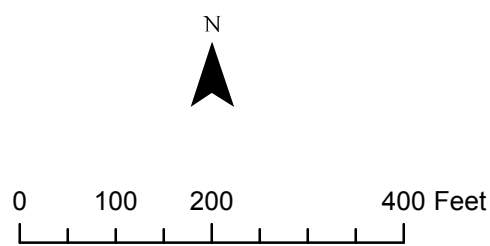
Appendix C
Delineation Map
Bright Source Energy Hidden Hills Ranch
Jurisdictional Delineation

Sheet 3 of 11



- Legend**
- 250-ft Buffer of Project Area
 - Project Boundary
 - Temporary Construction Area
 - Photographic Point
 - Ephemeral Desert Wash
 - Anastomose Desert Wash
 - Sheet Flow Area
 - Pooling Area
 - Pooling Area - Moist
 - Road From Aerial
 - Section Boundary
 - State Boundary

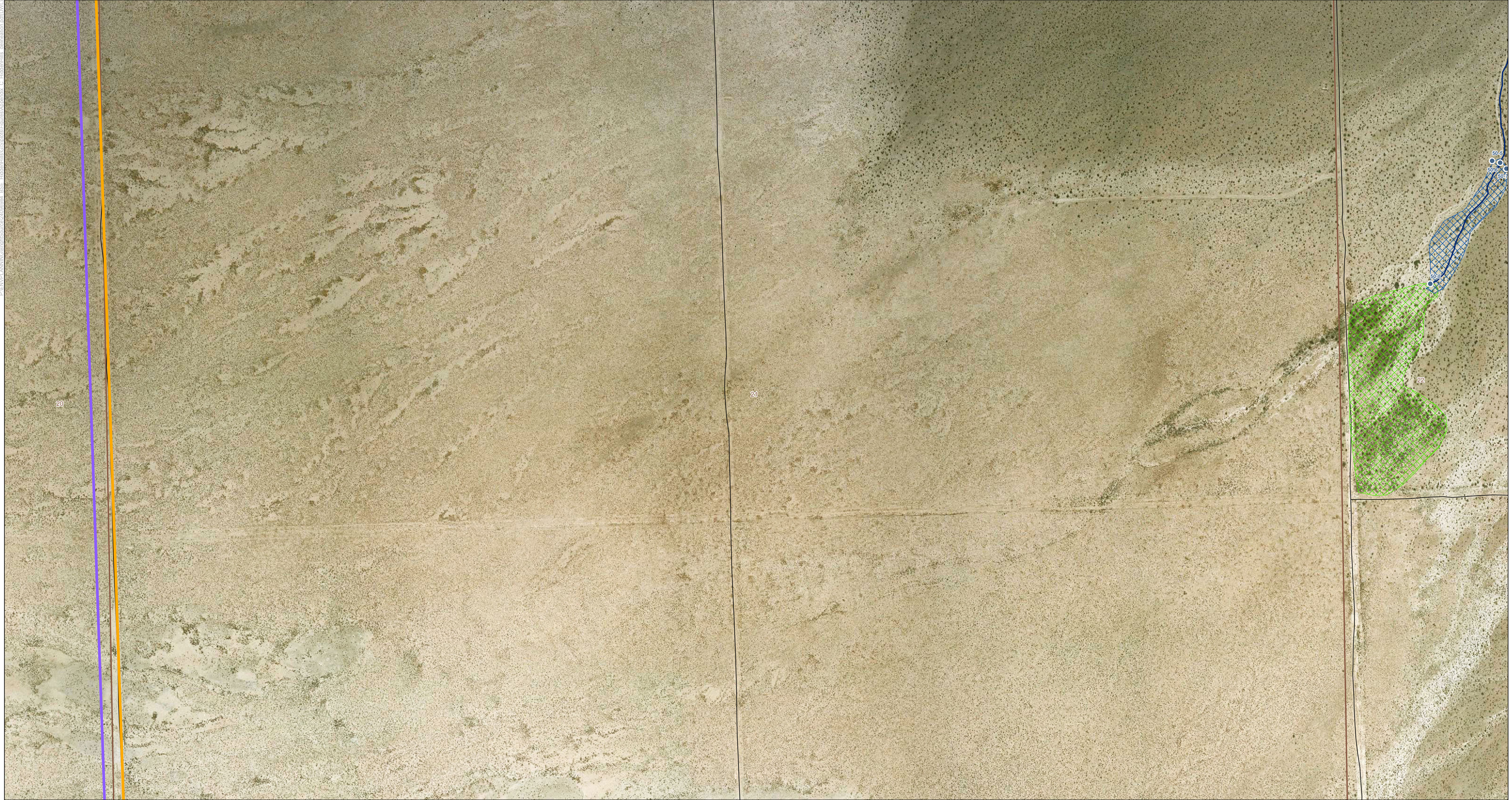
Source:
Aerial Imagery: VTN 2010
Project Boundary: VTN 2010
Wash Data: URS Corporation 2010 - 2011
Wash Features: URS Corporation 2011
Photographic Points: URS Corporation 2011



Map Panel Guide

2		
3	Sheet 4 of 11	
5	6	
7	8	9
10	11	

Appendix C
Delineation Map
Bright Source Energy Hidden Hills Ranch
Jurisdictional Delineation

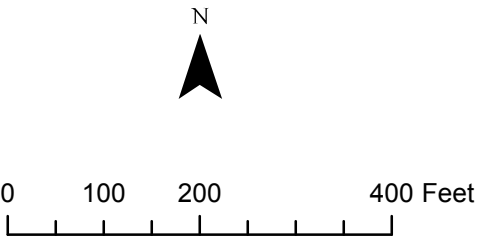


PIEN\PIANNING\GIS\p\Source\24090904_BSE_HiddenHills\Spades\Figures\Appendix C_HiddenHills_delineation.pdf[001]

- Legend**

 - 250-ft Buffer of Project Area
 - Project Boundary
 - Temporary Construction Area
 - Photographic Point
 - Ephemeral Desert Wash
- Anastomose Desert Wash
 - Sheet Flow Area
 - Pooling Area
 - Pooling Area - Moist
- Road From Aerial
 - Section Boundary
 - State Boundary

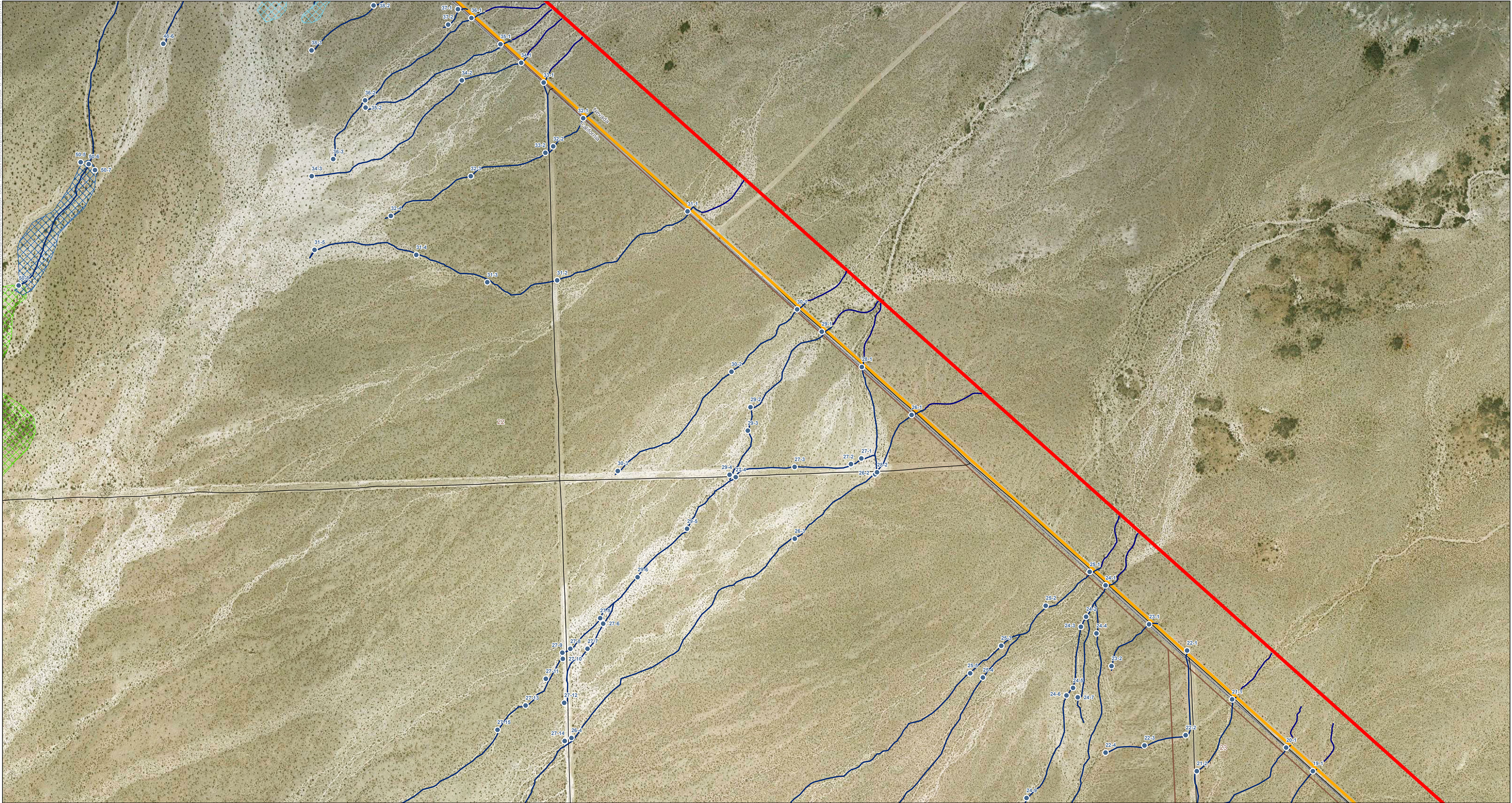
Source:
Aerial Imagery: VTN 2010
Project Boundary: VTN 2010
Wash Data: URS Corporation 2010 - 2011
Wash Features: URS Corporation 2011
Photographic Points: URS Corporation 2011



Map Panel Guide

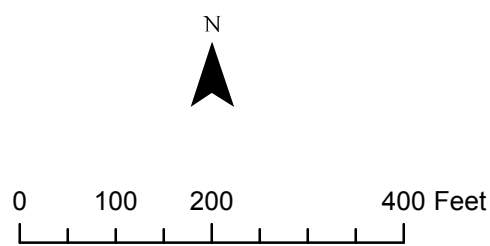
2		
3	4	
Sheet 5 of 11	6	
7	8	9
10	11	

Appendix C
Delineation Map
Bright Source Energy Hidden Hills Ranch
Jurisdictional Delineation



- Legend**
- 250-ft Buffer of Project Area
 - Project Boundary
 - Temporary Construction Area
 - Photographic Point
 - Ephemeral Desert Wash
 - Anastomose Desert Wash
 - Sheet Flow Area
 - Pooling Area
 - Pooling Area - Moist
 - Road From Aerial
 - Section Boundary
 - State Boundary

Source:
Aerial Imagery: VTN 2010
Project Boundary: VTN 2010
Wash Data: URS Corporation 2010 - 2011
Wash Features: URS Corporation 2011
Photographic Points: URS Corporation 2011



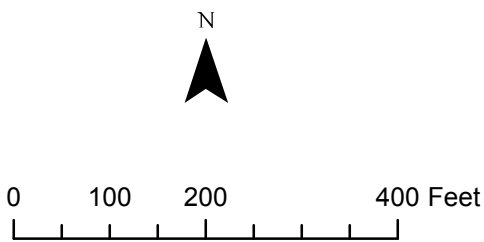
Map Panel Guide

2	
3	4
5	Sheet 6 of 11
7	8
10	11



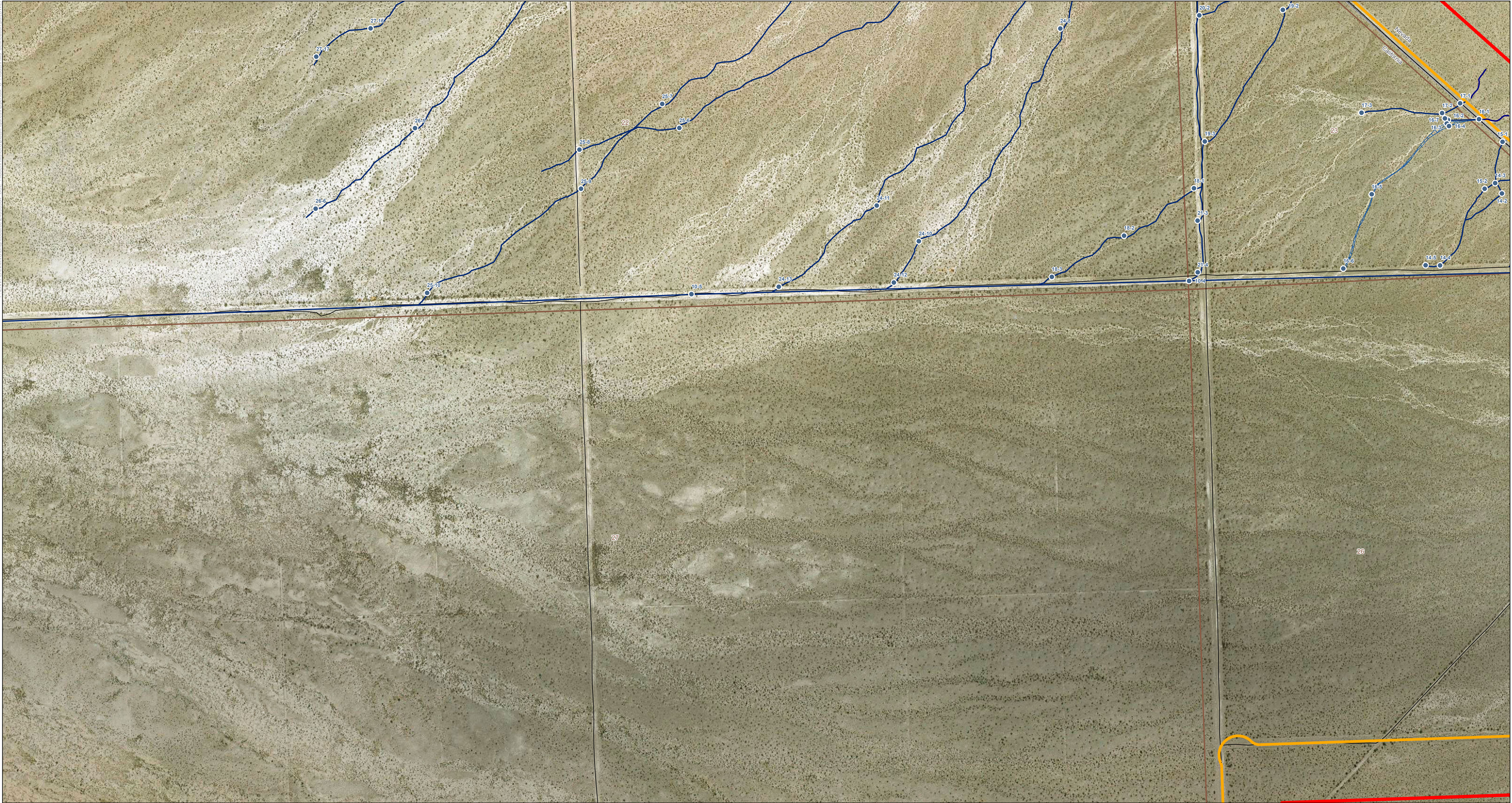
- Legend**
 - 250-ft Buffer of Project Area
 - Project Boundary
 - Temporary Construction Area
 - Photographic Point
 - Ephemeral Desert Wash
- Anastomose Desert Wash
 - Sheet Flow Area
 - Pooling Area
 - Pooling Area - Moist
- Road From Aerial
 - Section Boundary
 - State Boundary

Source:
Aerial Imagery: VTN 2010
Project Boundary: VTN 2010
Wash Data: URS Corporation 2010 - 2011
Wash Features: URS Corporation 2011
Photographic Points: URS Corporation 2011



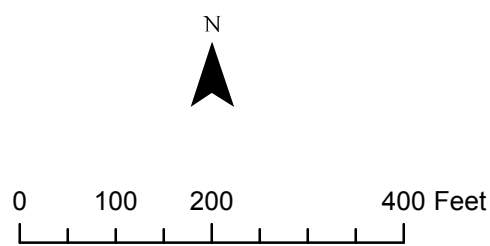
Map Panel Guide		
2		
3	4	
5	6	
Sheet 7 of 11	8	9
10	11	

Appendix C
Delineation Map
Bright Source Energy Hidden Hills Ranch
Jurisdictional Delineation



- Legend**
- 250-ft Buffer of Project Area
 - Project Boundary
 - Temporary Construction Area
 - Photographic Point
 - Ephemeral Desert Wash
 - Anastomose Desert Wash
 - Sheet Flow Area
 - Pooling Area
 - Pooling Area - Moist
 - Road From Aerial
 - Section Boundary
 - State Boundary

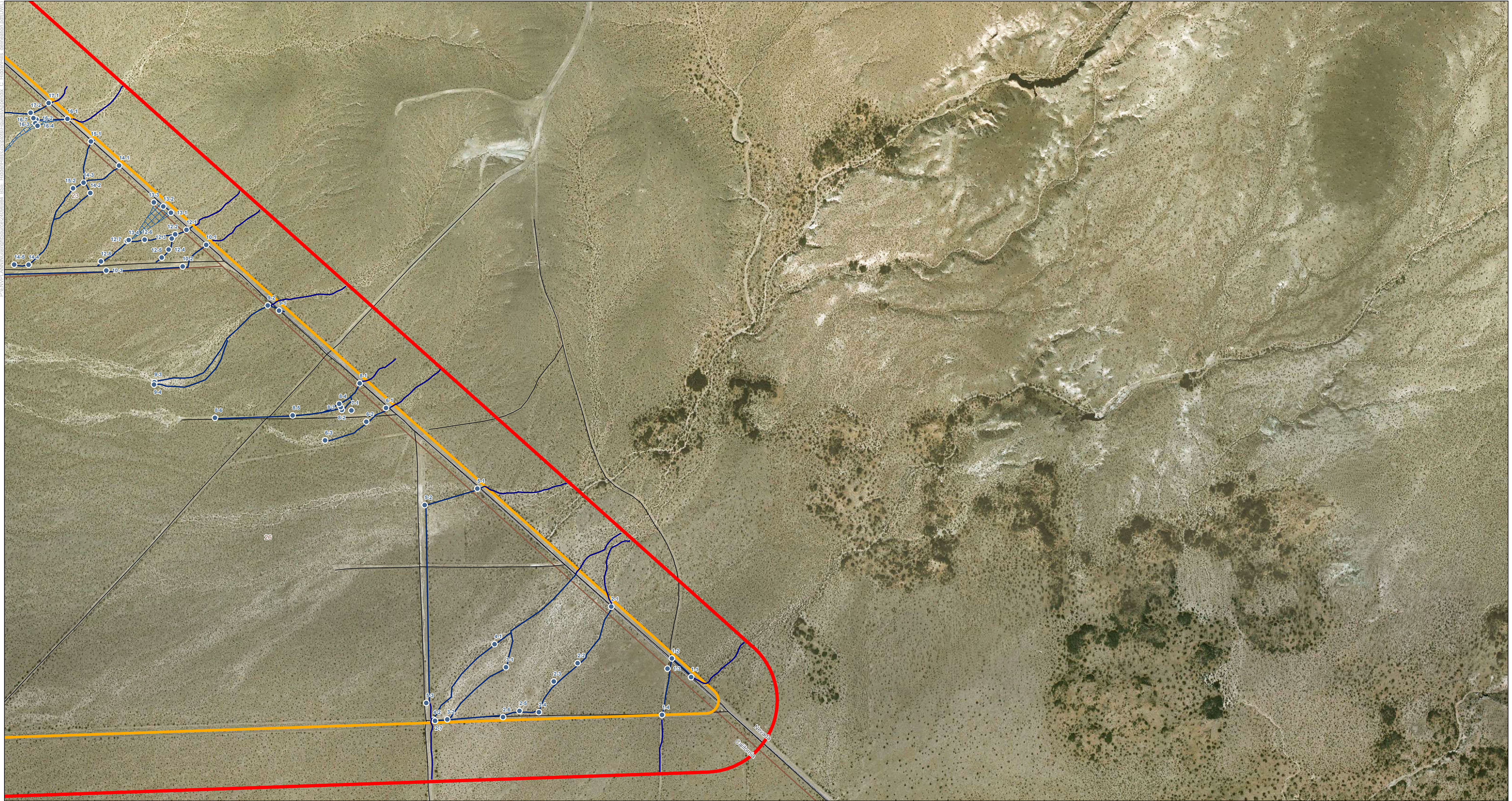
Source:
Aerial Imagery: VTN 2010
Project Boundary: VTN 2010
Wash Data: URS Corporation 2010 - 2011
Wash Features: URS Corporation 2011
Photographic Points: URS Corporation 2011



Map Panel Guide

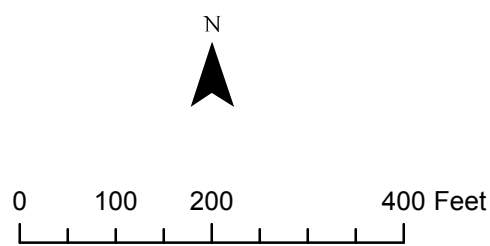
2	
3	4
5	6
7	Sheet 8 of 11
10	11

Appendix C
Delineation Map
Bright Source Energy Hidden Hills Ranch
Jurisdictional Delineation



- Legend**
- 250-ft Buffer of Project Area
 - Project Boundary
 - Temporary Construction Area
 - Photographic Point
 - Ephemeral Desert Wash
 - Anastomose Desert Wash
 - Sheet Flow Area
 - Pooling Area
 - Pooling Area - Moist
 - Road From Aerial
 - Section Boundary
 - State Boundary

Source:
Aerial Imagery: VTN 2010
Project Boundary: VTN 2010
Wash Data: URS Corporation 2010 - 2011
Wash Features: URS Corporation 2011
Photographic Points: URS Corporation 2011



Map Panel Guide

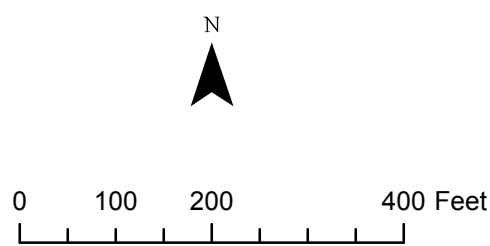
2		
3	4	
5	6	
7	8	Sheet 9 of 11
10	11	

Appendix C
Delineation Map
Bright Source Energy Hidden Hills Ranch
Jurisdictional Delineation



- Legend**
- 250-ft Buffer of Project Area
 - Project Boundary
 - Temporary Construction Area
 - Photographic Point
 - Ephemeral Desert Wash
 - Anastomose Desert Wash
 - Sheet Flow Area
 - Pooling Area
 - Pooling Area - Moist
 - Road From Aerial
 - Section Boundary
 - State Boundary

Source:
Aerial Imagery: VTN 2010
Project Boundary: VTN 2010
Wash Data: URS Corporation 2010 - 2011
Wash Features: URS Corporation 2011
Photographic Points: URS Corporation 2011



Map Panel Guide

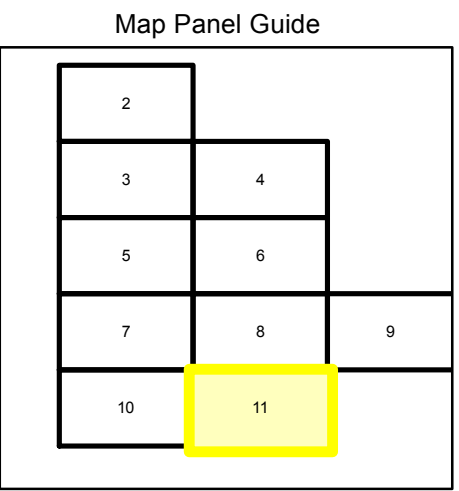
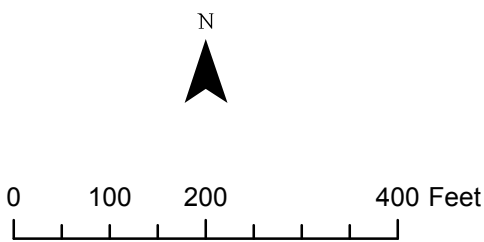
2		
3	4	
5	6	
7	8	9
10	11	

Appendix C
Delineation Map
Bright Source Energy Hidden Hills Ranch
Jurisdictional Delineation

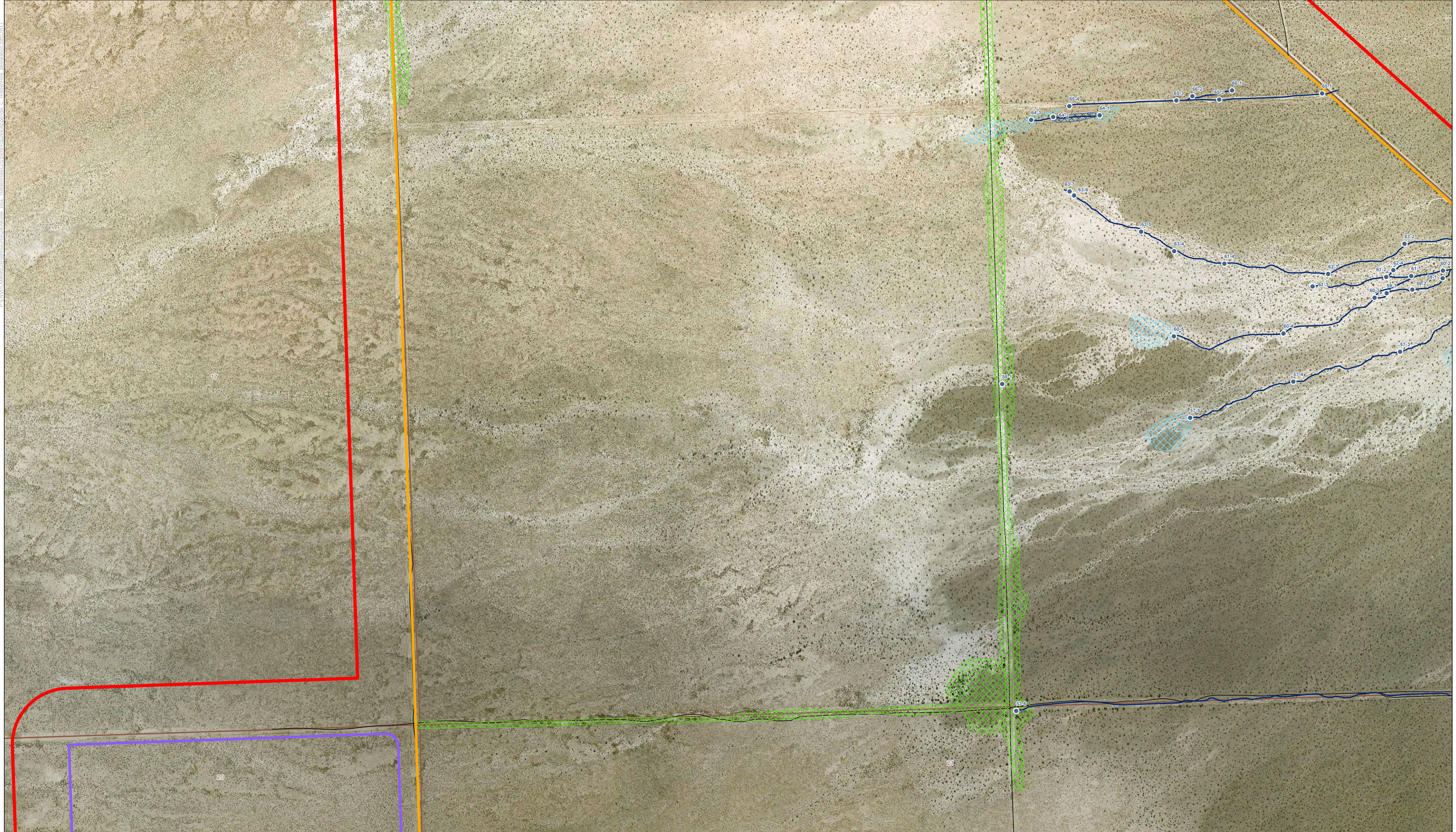


- Legend**
- 250-ft Buffer of Project Area
 - Project Boundary
 - Temporary Construction Area
 - Photographic Point
 - Ephemeral Desert Wash
 - Anastomose Desert Wash
 - Sheet Flow Area
 - Pooling Area
 - Pooling Area - Moist
 - Road From Aerial
 - Section Boundary
 - State Boundary

Source:
Aerial Imagery: VTN 2010
Project Boundary: VTN 2010
Wash Data: URS Corporation 2010 - 2011
Wash Features: URS Corporation 2011
Photographic Points: URS Corporation 2011

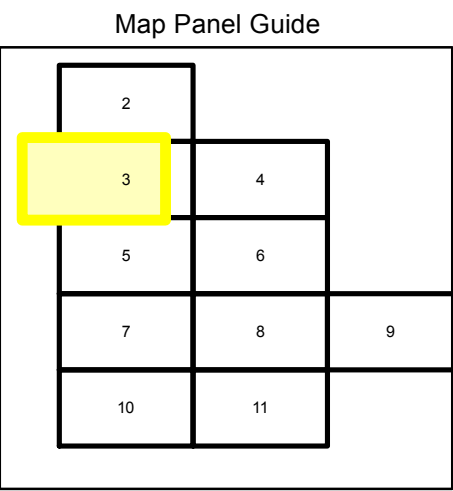
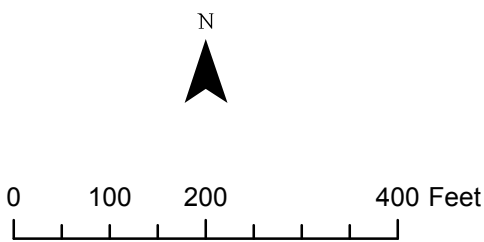


Appendix C
Delineation Map
Bright Source Energy Hidden Hills Ranch
Jurisdictional Delineation

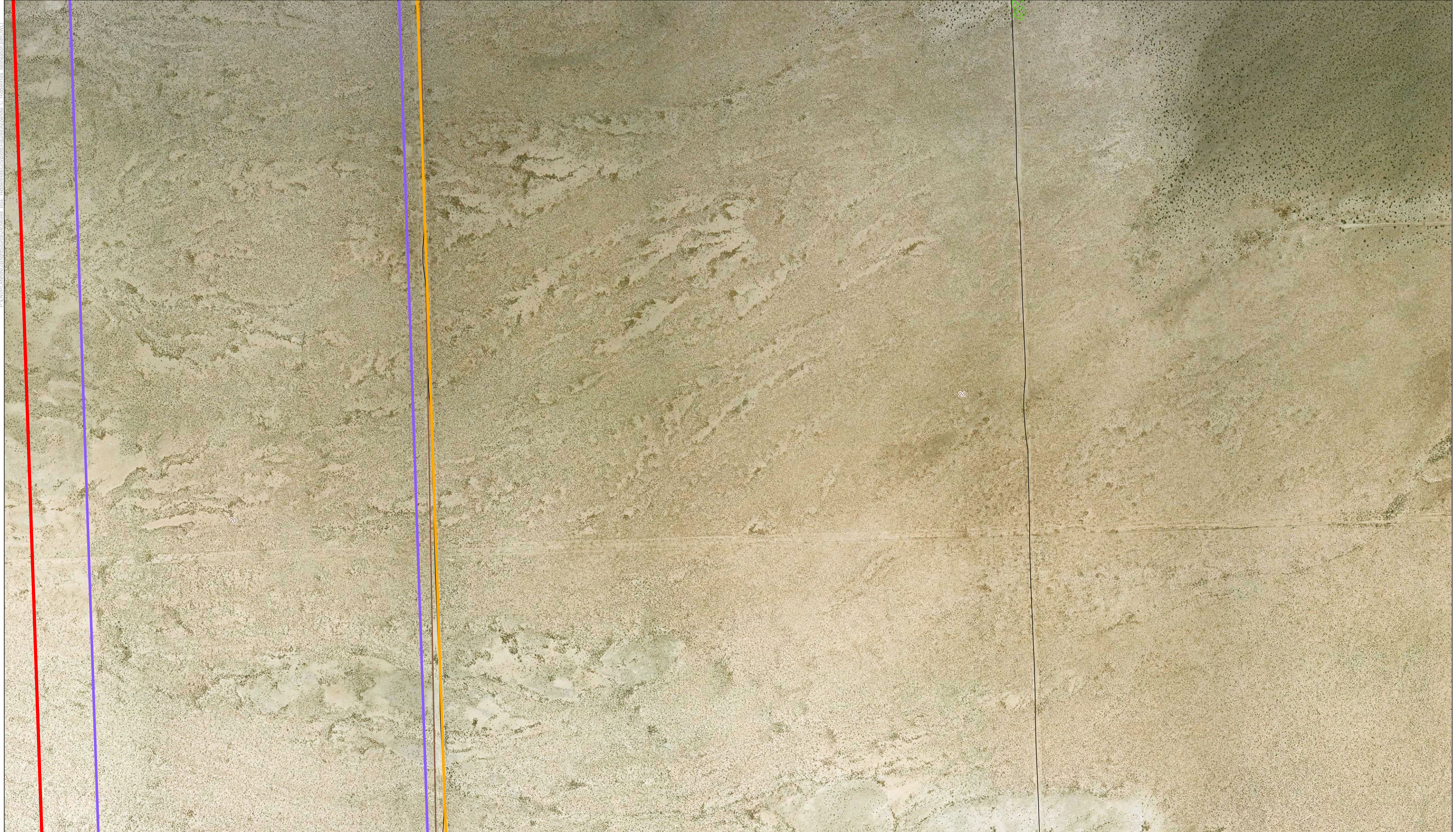


- Legend**
- 250-ft Buffer of Project Area
 - Project Boundary
 - Temporary Construction Area
 - Photographic Point
 - Ephemeral Desert Wash
 - Anastomosing Desert Wash
 - Sheet Flow Area
 - Pooling Area
 - Pooling Area - Moist
 - Road From Aerial
 - Section Boundary
 - State Boundary

Source:
Aerial Imagery: VTN 2010
Project Boundary: VTN 2010
Wash Data: URS Corporation 2010 - 2011
Wash Features: URS Corporation 2011
Photographic Points: URS Corporation 2011



Appendix C
Delineation Map
Bright Source Energy Hidden Hills Ranch
Jurisdictional Delineation
Staging Area North



- Legend**
- 250-ft Buffer of Project Area

Project Boundary

Temporary Construction Area

Photographic Point

Ephemeral Desert Wash

Anastomose Desert Wash

Sheet Flow Area

Pooling Area

Pooling Area - Moist

Road From Aerial

Section Boundary

State Boundary
- Source:
Aerial Imagery: VTN 2010
Project Boundary: VTN 2010
Wash Data: URS Corporation 2010 - 2011
Wash Features: URS Corporation 2011
Photographic Points: URS Corporation 2011
- N

0

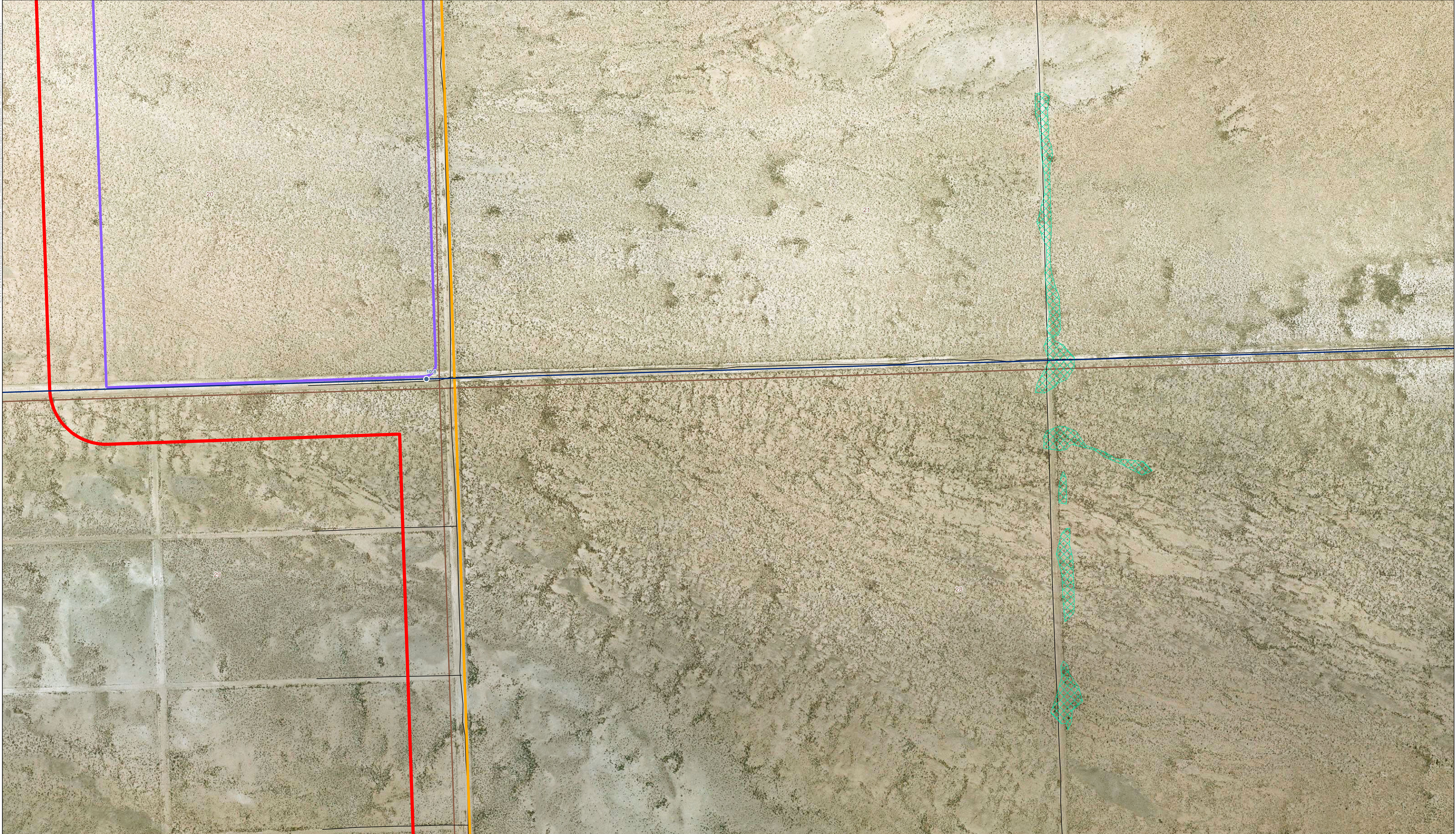
100

200

400 Feet
- Map Panel Guide

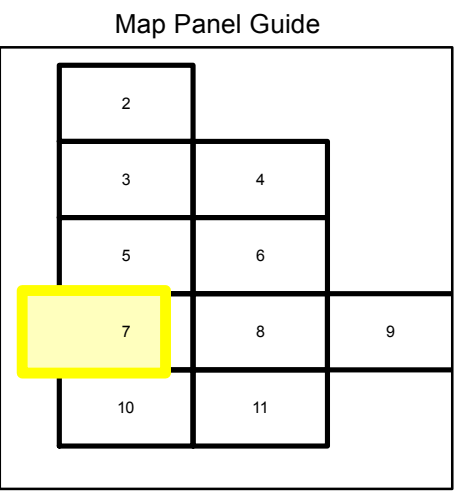
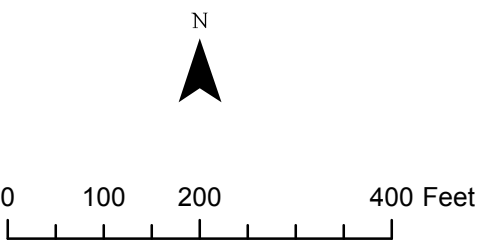
2		
3	4	
5	6	
7	8	9
10	11	
- Appendix C**
Delineation Map
Bright Source Energy Hidden Hills Ranch
Jurisdictional Delineation

Staging Area Middle



- Legend**
- 250-ft Buffer of Project Area
 - Project Boundary
 - Temporary Construction Area
 - Photographic Point
 - Ephemeral Desert Wash
 - Anastomose Desert Wash
 - Sheet Flow Area
 - Pooling Area
 - Pooling Area - Moist
 - Road From Aerial
 - Section Boundary
 - State Boundary

Source:
Aerial Imagery: VTN 2010
Project Boundary: VTN 2010
Wash Data: URS Corporation 2010 - 2011
Wash Features: URS Corporation 2011
Photographic Points: URS Corporation 2011



Appendix C
Delineation Map
Bright Source Energy Hidden Hills Ranch
Jurisdictional Delineation
Staging Area South

Attachment B3
CNDDDB Forms

ATTACHMENT B3

Wildlife CNDDDB Forms

The attached CNDDDB forms were provided by Sundance Biology, Inc. from the wildlife surveys they performed at the site.

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 04/13/2011

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Lanius ludovicianus*

Common Name: Loggerhead shrike

Species Found? ☒ Yes ☐ No If not, why? _____
Total No. Individuals 1 Subsequent Visit? ☐ yes ☒ no
Is this an existing NDDDB occurrence? ☐ no ☒ unk.
Yes, Occ. # _____
Collection? If yes: 0
Number Museum / Herbarium

Reporter: Steve Boland
Address: 179 Niblick Road, PMB 272
Paso Robles, CA 93446
E-mail Address: spboland@aol.com
Phone: (928) 380-8850

Plant Information

Phenology: 0% vegetative 0% flowering 0% fruiting

Animal Information

1 # adults 0 # juveniles 0 # larvae 0 # egg masses 0 # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☒ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Inyo Landowner / Mgr.: Private Land
Quad Name: _____ Elevation: _____
T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ Source of Coordinates (GPS, topo. map & type): GPS
T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ GPS Make & Model Garmin Map
DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐
Coordinates: 0597700
3986252

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Lanius ludovicianus flying and perched east of the UTM's provided.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Immediate AND surrounding land use: Private land with housing structures.

Visible disturbances: There appears to have been sheep grazing. Road infrastructure for an old housing development. Multiple types (motorcycle,

Threats: Off road use and grazing of livestock.

Comments: *(SUV, and passenger) of vehicles were observed using roads.

Determination: (check one or more, and fill in blanks)

- ☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☒ By another person (name): Amanda Scheib
☐ Other: _____

Photographs: (check one or more)

Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 04/21/2011

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Aquila chrysaetos*

Common Name: Golden Eagle

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 1 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDDB occurrence? ☐ no ☒ unk.
Yes, Occ. # _____

Collection? If yes: 0
Number Museum / Herbarium

Reporter: Steve Boland

Address: 179 Niblick Road, PMB 272
Paso Robles, CA 93446

E-mail Address: spboland@aol.com

Phone: (928) 380-8850

Plant Information

Phenology: 0% vegetative 0% flowering 0% fruiting

Animal Information

2 # adults 0 # juveniles 0 # larvae 0 # egg masses 0 # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☒ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Inyo Landowner / Mgr.: Private Land

Quad Name: _____ Elevation: _____

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ GPS Make & Model Garmin Map

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: 0598835
3985279

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Two Aquila chrysaetos flying east of point.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Immediate AND surrounding land use: Private land with housing structures.

Visible disturbances: Road infrastructure for an old housing development. Multiple types (motorcycle,

Threats: Off road use and grazing of livestock.

Comments: *(SUV, and passenger) of vehicles were observed using roads.

Determination: (check one or more, and fill in blanks)

- ☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☒ By another person (name): Amanda Scheib
☐ Other: _____

Photographs: (check one or more)

Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 04/21/2011

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Aquila chrysaetos*

Common Name: Golden Eagle

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 1 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDDB occurrence? ☐ no ☒ unk.
Yes, Occ. # _____

Collection? If yes: 0
Number Museum / Herbarium

Reporter: Steve Boland

Address: 179 Niblick Road, PMB 272
Paso Robles, CA 93446

E-mail Address: spboland@aol.com

Phone: (928) 380-8850

Plant Information

Phenology: 0% vegetative 0% flowering 0% fruiting

Animal Information

0 # adults 1 # juveniles 0 # larvae 0 # egg masses 0 # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☒ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Inyo Landowner / Mgr.: Private Land

Quad Name: _____ Elevation: _____

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ GPS Make & Model Garmin Map

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: 0599331
3983720

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

One Aquila chrysaetos flying low to the ground at this gps point.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Immediate AND surrounding land use: Private land with housing structures.

Visible disturbances: Road infrastructure for an old housing development. Multiple types (motorcycle,

Threats: Off road use and grazing of livestock.

Comments: *(SUV, and passenger) of vehicles were observed using roads.

Determination: (check one or more, and fill in blanks)

- ☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☒ By another person (name): Amanda Scheib
☐ Other: _____

Photographs: (check one or more)

Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 04/22/2011

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Gopherus agassizii*

Common Name: Desert Tortoise

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 1 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDDB occurrence? ☐ no ☒ unk.
Yes, Occ. # _____

Collection? If yes: 0
Number Museum / Herbarium

Reporter: Steve Boland

Address: 179 Niblick Road, PMB 272
Paso Robles, CA 93446

E-mail Address: spboland@aol.com

Phone: (928) 380-8850

Plant Information

Phenology: 0% vegetative 0% flowering 0% fruiting

Animal Information

1 0 0 0 0
adults # juveniles # larvae # egg masses # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☒ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Inyo Landowner / Mgr.: Private Land

Quad Name: _____ Elevation: _____

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ GPS Make & Model Garmin GPSMap76C

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: 0599653
3984818

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Immature tortoise found in a burrow resting in Creosote Bush Scrub habitat.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Immediate AND surrounding land use: Private land with housing structures.

Visible disturbances: There appears to have been sheep grazing. Road infrastructure for an old housing development. Multiple types (motorcycle,

Threats: Corvus corax observed nesting in area. Aquila chrysaetos observed flying in area. Off road use and grazing of livestock.

Comments: *(SUV, and passenger) of vehicles were observed using roads.

Determination: (check one or more, and fill in blanks)

- ☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☒ By another person (name): Amanda Scheib
☐ Other: _____

Photographs: (check one or more)

Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 04/22/2011

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Gopherus agassizii*

Common Name: Desert Tortoise

Species Found? ☒ Yes ☐ No If not, why? _____
Total No. Individuals 1 Subsequent Visit? ☐ yes ☒ no
Is this an existing NDDDB occurrence? ☐ no ☒ unk. Yes, Occ. # _____
Collection? If yes: 0 Number Museum / Herbarium

Reporter: Steve Boland
Address: 179 Niblick Road, PMB 272
Paso Robles, CA 93446
E-mail Address: spboland@aol.com
Phone: (928) 380-8850

Plant Information

Phenology: 0% vegetative 0% flowering 0% fruiting

Animal Information

1 # adults 0 # juveniles 0 # larvae 0 # egg masses 0 # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☒ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Inyo Landowner / Mgr.: Private Land
Quad Name: _____ Elevation: _____
T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ Source of Coordinates (GPS, topo. map & type): GPS
T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ GPS Make & Model Garmin Map
DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐
Coordinates: 0599854
3984829

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Male tortoise found resting next to Larrea tridentata in Creosote Bush Scrub habitat.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Immediate AND surrounding land use: Private land with housing structures.

Visible disturbances: There appears to have been sheep grazing. Road infrastructure for an old housing development. Multiple types (motorcycle,

Threats: Corvus corax observed nesting in area. Aquila chrysaetos observed flying in area. Off road use and grazing of livestock.

Comments: *(SUV, and passenger) of vehicles were observed using roads.

Determination: (check one or more, and fill in blanks)

- ☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☒ By another person (name): Amanda Scheib
☐ Other: _____

Photographs: (check one or more)

Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 04/22/2011

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Gopherus agassizii*

Common Name: Desert Tortoise

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 1 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDDB occurrence? ☐ no ☒ unk.
Yes, Occ. # _____

Collection? If yes: 0
Number Museum / Herbarium

Reporter: Steve Boland

Address: 179 Niblick Road, PMB 272
Paso Robles, CA 93446

E-mail Address: spboland@aol.com

Phone: (928) 380-8850

Plant Information

Phenology: 0% vegetative 0% flowering 0% fruiting

Animal Information

0 # adults 1 # juveniles 0 # larvae 0 # egg masses 0 # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☒ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Inyo Landowner / Mgr.: Private Land

Quad Name: _____ Elevation: _____

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ GPS Make & Model Garmin Map

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: 0599795
3984557

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Juvenile tortoise found walking in open in Creosote Bush Scrub habitat.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Immediate AND surrounding land use: Private land with housing structures.

Visible disturbances: There appears to have been sheep grazing. Road infrastructure for an old housing development. Multiple types (motorcycle,

Threats: Corvus corax observed nesting in area. Aquila chrysaetos observed flying in area. Off road use and grazing of livestock.

Comments: *(SUV, and passenger) of vehicles were observed using roads.

Determination: (check one or more, and fill in blanks)

- ☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☒ By another person (name): Amanda Scheib
☐ Other: _____

Photographs: (check one or more)

Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 04/24/2011

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Gopherus agassizii*

Common Name: Desert Tortoise

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 1 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDDB occurrence? ☐ no ☒ unk.
Yes, Occ. # _____

Collection? If yes: 0
Number Museum / Herbarium

Reporter: Steve Boland

Address: 179 Niblick Road, PMB 272
Paso Robles, CA 93446

E-mail Address: spboland@aol.com

Phone: (928) 380-8850

Plant Information

Phenology: 0% vegetative 0% flowering 0% fruiting

Animal Information

1 # adults 0 # juveniles 0 # larvae 0 # egg masses 0 # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☒ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Inyo Landowner / Mgr.: Private Land

Quad Name: _____ Elevation: _____

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S GPS Make & Model Garmin Map

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: 0599641
3983970

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Female tortoise found basking next to Larrea tridentata in Creosote Bush Scrub habitat.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Immediate AND surrounding land use: Private land with housing structures.

Visible disturbances: There appears to have been sheep grazing. Road infrastructure for an old housing development. Multiple types (motorcycle,

Threats: Corvus corax observed nesting in area. Aquila chrysaetos observed flying in area. Off road use and grazing of livestock.

Comments: *(SUV, and passenger) of vehicles were observed using roads.

Determination: (check one or more, and fill in blanks)

- ☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☒ By another person (name): Amanda Scheib
☐ Other: _____

Photographs: (check one or more)

Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 04/27/2011

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Gopherus agassizii*

Common Name: Desert Tortoise

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 1 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDDB occurrence? ☐ no ☒ unk.
Yes, Occ. # _____

Collection? If yes: 0
Number Museum / Herbarium

Reporter: Steve Boland

Address: 179 Niblick Road, PMB 272
Paso Robles, CA 93446

E-mail Address: spboland@aol.com

Phone: (928) 380-8850

Plant Information

Phenology: 0% vegetative 0% flowering 0% fruiting

Animal Information

1 # adults 0 # juveniles 0 # larvae 0 # egg masses 0 # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☒ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Inyo Landowner / Mgr.: Private Land

Quad Name: _____ Elevation: _____

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S GPS Make & Model Garmin Map

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: 0601545
3983074

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Female tortoise found walking in open in Creosote Bush Scrub habitat.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Immediate AND surrounding land use: Private land with housing structures.

Visible disturbances: There appears to have been sheep grazing. Road infrastructure for an old housing development. Multiple types (motorcycle,

Threats: Corvus corax observed nesting in area. Aquila chrysaetos observed flying in area. Off road use and grazing of livestock.

Comments: *(SUV, and passenger) of vehicles were observed using roads.

Determination: (check one or more, and fill in blanks)

- ☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☒ By another person (name): Amanda Scheib
☐ Other: _____

Photographs: (check one or more)

Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 04/29/2011

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Gopherus agassizii*

Common Name: Desert Tortoise

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 1 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDDB occurrence? ☐ no ☒ unk.
Yes, Occ. # _____

Collection? If yes: 0
Number Museum / Herbarium

Reporter: Steve Boland

Address: 179 Niblick Road, PMB 272
Paso Robles, CA 93446

E-mail Address: spboland@aol.com

Phone: (928) 380-8850

Plant Information

Phenology: 0% vegetative 0% flowering 0% fruiting

Animal Information

1 0 0 0 0
adults # juveniles # larvae # egg masses # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☒ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Inyo Landowner / Mgr.: Private Land

Quad Name: _____ Elevation: _____

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S GPS Make & Model Garmin Map

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: 0601454
3982425

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Male tortoise resting in open in Creosote Bush Scrub habitat.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Immediate AND surrounding land use: Private land with housing structures.

Visible disturbances: There appears to have been sheep grazing. Road infrastructure for an old housing development. Multiple types (motorcycle,

Threats: Corvus corax observed nesting in area. Aquila chrysaetos observed flying in area. Off road use and grazing of livestock.

Comments: *(SUV, and passenger) of vehicles were observed using roads.

Determination: (check one or more, and fill in blanks)

- ☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☒ By another person (name): Amanda Scheib
☐ Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 04/29/2011

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Gopherus agassizii*

Common Name: Desert Tortoise

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 1 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDDB occurrence? ☐ no ☒ unk.
Yes, Occ. # _____

Collection? If yes: 0
Number Museum / Herbarium

Reporter: Steve Boland

Address: 179 Niblick Road, PMB 272
Paso Robles, CA 93446

E-mail Address: spboland@aol.com

Phone: (928) 380-8850

Plant Information

Phenology: 0% vegetative 0% flowering 0% fruiting

Animal Information

1 0 0 0 0
adults # juveniles # larvae # egg masses # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☒ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Inyo Landowner / Mgr.: Private Land

Quad Name: _____ Elevation: _____

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S GPS Make & Model Garmin Map

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: 0601788
3982307

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Male tortoise resting on mound of burrow in Creosote Bush Scrub habitat.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Immediate AND surrounding land use: Private land with housing structures.

Visible disturbances: There appears to have been sheep grazing. Road infrastructure for an old housing development. Multiple types (motorcycle,

Threats: Corvus corax observed nesting in area. Aquila chrysaetos observed flying in area. Off road use and grazing of livestock.

Comments: *(SUV, and passenger) of vehicles were observed using roads.

Determination: (check one or more, and fill in blanks)

- ☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☒ By another person (name): Amanda Scheib
☐ Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 05/04/2011

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Gopherus agassizii*

Common Name: Desert Tortoise

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 1 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDDB occurrence? ☐ no ☒ unk.
Yes, Occ. # _____

Collection? If yes: 0
Number Museum / Herbarium

Reporter: Steve Boland

Address: 179 Niblick Road, PMB 272
Paso Robles, CA 93446

E-mail Address: spboland@aol.com

Phone: (928) 380-8850

Plant Information

Phenology: 0% vegetative 0% flowering 0% fruiting

Animal Information

1 # adults 0 # juveniles 0 # larvae 0 # egg masses 0 # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☒ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Inyo Landowner / Mgr.: Private Land

Quad Name: _____ Elevation: _____

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S GPS Make & Model Garmin Map

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: 0600314
3981313

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Male tortoise resting in open in Creosote Bush Scrub habitat.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Immediate AND surrounding land use: Private land with housing structures.

Visible disturbances: There appears to have been sheep grazing. Road infrastructure for an old housing development. Multiple types (motorcycle,

Threats: Corvus corax observed nesting in area. Aquila chrysaetos observed flying in area. Off road use and grazing of livestock.

Comments: *(SUV, and passenger) of vehicles were observed using roads.

Determination: (check one or more, and fill in blanks)

- ☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☒ By another person (name): Amanda Scheib
☐ Other: _____

Photographs: (check one or more)

Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 05/04/2011

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Gopherus agassizii*

Common Name: Desert Tortoise

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 1 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDDB occurrence? ☐ no ☒ unk.
Yes, Occ. # _____

Collection? If yes: 0
Number Museum / Herbarium

Reporter: Steve Boland

Address: 179 Niblick Road, PMB 272
Paso Robles, CA 93446

E-mail Address: spboland@aol.com

Phone: (928) 380-8850

Plant Information

Phenology: 0% vegetative 0% flowering 0% fruiting

Animal Information

1 # adults 0 # juveniles 0 # larvae 0 # egg masses 0 # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☒ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Inyo Landowner / Mgr.: Private Land

Quad Name: _____ Elevation: _____

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ GPS Make & Model Garmin Map

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: 0600349
3981341

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Tortoise resting under cover of Larrea tridentata in Creosote Bush Scrub habitat.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Immediate AND surrounding land use: Private land with housing structures.

Visible disturbances: There appears to have been sheep grazing. Road infrastructure for an old housing development. Multiple types (motorcycle,

Threats: Corvus corax observed nesting in area. Aquila chrysaetos observed flying in area. Off road use and grazing of livestock.

Comments: *(SUV, and passenger) of vehicles were observed using roads.

Determination: (check one or more, and fill in blanks)

- ☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☒ By another person (name): Amanda Scheib
☐ Other: _____

Photographs: (check one or more)

Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 04/14/2011

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Gopherus agassizii*

Common Name: Desert Tortoise

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 1 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDDB occurrence? ☐ no ☒ unk.
Yes, Occ. # _____

Collection? If yes: 0
Number Museum / Herbarium

Reporter: Steve Boland

Address: 179 Niblick Road, PMB 272
Paso Robles, CA 93446

E-mail Address: spboland@aol.com

Phone: (928) 380-8850

Plant Information

Phenology: 0% vegetative 0% flowering 0% fruiting

Animal Information

1 # adults 0 # juveniles 0 # larvae 0 # egg masses 0 # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☒ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Inyo Landowner / Mgr.: Private Land

Quad Name: _____ Elevation: _____

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ GPS Make & Model Garmin Map

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: 0595640
3987334

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Male tortoise walking, then eating in Salt Bush Scrub habitat.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Immediate AND surrounding land use: Private land with housing structures.

Visible disturbances: There appears to have been sheep grazing. Road infrastructure for an old housing development. Multiple types (motorcycle,

Threats: Corvus corax observed nesting in area. Aquila chrysaetos observed flying in area. Off road use and grazing of livestock.

Comments: *(SUV, and passenger) of vehicles were observed using roads.

Determination: (check one or more, and fill in blanks)

- ☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☒ By another person (name): Amanda Scheib
☐ Other: _____

Photographs: (check one or more)

Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 05/17/2011

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Gopherus agassizii*

Common Name: Desert Tortoise

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 1 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDDB occurrence? ☐ no ☒ unk.
Yes, Occ. # _____

Collection? If yes: 0
Number Museum / Herbarium

Reporter: Steve Boland

Address: 179 Niblick Road, PMB 272
Paso Robles, CA 93446

E-mail Address: spboland@aol.com

Phone: (928) 380-8850

Plant Information

Phenology: 0% vegetative 0% flowering 0% fruiting

Animal Information

1 # adults 0 # juveniles 0 # larvae 0 # egg masses 0 # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☒ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Inyo Landowner / Mgr.: Private Land

Quad Name: _____ Elevation: _____

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ GPS Make & Model Garmin Map

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: 0600030
3984830

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Immature tortoise walking in open in Creosote bush scrub habitat.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Immediate AND surrounding land use: Private land with housing structures.

Visible disturbances: There appears to have been sheep grazing. Road infrastructure for an old housing development. Multiple types (motorcycle,

Threats: Corvus corax observed nesting in area. Aquila chrysaetos observed flying in area. Off road use and grazing of livestock.

Comments: *(SUV, and passenger) of vehicles were observed using roads.

Determination: (check one or more, and fill in blanks)

- ☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☒ By another person (name): Amanda Scheib
☐ Other: _____

Photographs: (check one or more)

Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 05/17/2011

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Gopherus agassizii*

Common Name: Desert Tortoise

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 1 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDDB occurrence? ☐ no ☒ unk.
Yes, Occ. # _____

Collection? If yes: 0
Number Museum / Herbarium

Reporter: Steve Boland

Address: 179 Niblick Road, PMB 272
Paso Robles, CA 93446

E-mail Address: spboland@aol.com

Phone: (928) 380-8850

Plant Information

Phenology: 0% vegetative 0% flowering 0% fruiting

Animal Information

1 # adults 0 # juveniles 0 # larvae 0 # egg masses 0 # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☒ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Inyo Landowner / Mgr.: Private Land

Quad Name: _____ Elevation: _____

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ GPS Make & Model Garmin Map

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: 0600938
3984267

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Adult tortoise in burrow, tunnel facing out in Creosote bush scrub habitat.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Immediate AND surrounding land use: Private land with housing structures.

Visible disturbances: There appears to have been sheep grazing. Road infrastructure for an old housing development. Multiple types (motorcycle,

Threats: Corvus corax observed nesting in area. Aquila chrysaetos observed flying in area. Off road use and grazing of livestock.

Comments: *(SUV, and passenger) of vehicles were observed using roads.

Determination: (check one or more, and fill in blanks)

- ☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☒ By another person (name): Amanda Scheib
☐ Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 05/15/2011

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Gopherus agassizii*

Common Name: Desert Tortoise

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 1 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDDB occurrence? ☐ no ☒ unk.
Yes, Occ. # _____

Collection? If yes: 0
Number Museum / Herbarium

Reporter: Steve Boland

Address: 179 Niblick Road, PMB 272
Paso Robles, CA 93446

E-mail Address: spboland@aol.com

Phone: (928) 380-8850

Plant Information

Phenology: 0% vegetative 0% flowering 0% fruiting

Animal Information

1 # adults 0 # juveniles 0 # larvae 0 # egg masses 0 # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☒ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Inyo Landowner / Mgr.: Private Land

Quad Name: _____ Elevation: _____

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ GPS Make & Model Garmin Map

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: 0597125
3987381

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Adult male tortoise under cover of Larrea tridentata with another adult tortoise. This tortoise was being pushed by another adult male tortoise. Tortoise found in Creosote bush scrub habitat.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Immediate AND surrounding land use: Private land with housing structures.

Visible disturbances: There appears to have been sheep grazing. Road infrastructure for an old housing development. Multiple types (motorcycle,

Threats: Corvus corax observed nesting in area. Aquila chrysaetos observed flying in area. Off road use and grazing of livestock.

Comments: *(SUV, and passenger) of vehicles were observed using roads.

Determination: (check one or more, and fill in blanks)

- ☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☒ By another person (name): Amanda Scheib
☐ Other: _____

Photographs: (check one or more)

Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 05/15/2011

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Gopherus agassizii*

Common Name: Desert Tortoise

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 1 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDDB occurrence? ☐ no ☒ unk.
Yes, Occ. # _____

Collection? If yes: 0
Number Museum / Herbarium

Reporter: Steve Boland

Address: 179 Niblick Road, PMB 272
Paso Robles, CA 93446

E-mail Address: spboland@aol.com

Phone: (928) 380-8850

Plant Information

Phenology: 0% vegetative 0% flowering 0% fruiting

Animal Information

1 # adults 0 # juveniles 0 # larvae 0 # egg masses 0 # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☒ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Inyo Landowner / Mgr.: Private Land

Quad Name: _____ Elevation: _____

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ GPS Make & Model Garmin Map

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: 0597125
3987381

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Adult male tortoise under cover of Larrea tridentata with another adult tortoise. This tortoise was pushing another adult tortoise.
Tortoise found in Creosote bush scrub habitat.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Immediate AND surrounding land use: Private land with housing structures.

Visible disturbances: There appears to have been sheep grazing. Road infrastructure for an old housing development. Multiple types (motorcycle,

Threats: Corvus corax observed nesting in area. Aquila chrysaetos observed flying in area. Off road use and grazing of livestock.

Comments: *(SUV, and passenger) of vehicles were observed using roads.

Determination: (check one or more, and fill in blanks)

- ☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☒ By another person (name): Amanda Scheib
☐ Other: _____

Photographs: (check one or more)

Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 05/18/2011

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Gopherus agassizii*

Common Name: Desert Tortoise

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 1 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDDB occurrence? ☐ no ☒ unk.
Yes, Occ. # _____

Collection? If yes: 0
Number Museum / Herbarium

Reporter: Steve Boland

Address: 179 Niblick Road, PMB 272
Paso Robles, CA 93446

E-mail Address: spboland@aol.com

Phone: (928) 380-8850

Plant Information

Phenology: 0% vegetative 0% flowering 0% fruiting

Animal Information

1 # adults 0 # juveniles 0 # larvae 0 # egg masses 0 # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☒ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Inyo Landowner / Mgr.: Private Land

Quad Name: _____ Elevation: _____

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S GPS Make & Model Garmin Map

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: 0603615
3981879

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Adult male tortoise found resting under cover of Larrea tridentata in Creosote bush scrub habitat.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Immediate AND surrounding land use: Private land with housing structures.

Visible disturbances: There appears to have been sheep grazing. Road infrastructure for an old housing development. Multiple types (motorcycle,

Threats: Corvus corax observed nesting in area. Aquila chrysaetos observed flying in area. Off road use and grazing of livestock.

Comments: *(SUV, and passenger) of vehicles were observed using roads.

Determination: (check one or more, and fill in blanks)

- ☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☒ By another person (name): Amanda Scheib
☐ Other: _____

Photographs: (check one or more)

Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

ATTACHMENT B3

Botany CNDDDB Forms

The attached CNDDDB forms were provided by Garcia and Associates from the botany surveys they performed at the site.

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Androstephium breviflorum*

Common Name: pink funnel-lily

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 440 Subsequent Visit? ☐ yes ☐ no

Is this an existing NDDDB occurrence? ☒ no ☐ unk.
Yes, Occ. # _____

Collection? If yes: AH 2665 UC Riverside eventually
Number Museum / Herbarium

Reporter: Ann Howald, Garcia and Associates

Address: 210 Chestnut Avenue
Sonoma, CA 95476

E-mail Address: annhowald@vom.com

Phone: (707) 721-6120

Plant Information

Phenology: 90 % 5 % 5 %
vegetative flowering fruiting

Animal Information

adults # juveniles # larvae # egg masses # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Hidden Hills SEGS Site & 250' buffer. North of Old Spanish Trail Hwy, adjacent to CA/NV state line. See AFC for figures showing location of Site and buffer, and localities of this species within Site & buffer.

County: Inyo Landowner / Mgr.: Private

Quad Name: Calvada Springs, Mound Spring Elevation: approx 2620 ft

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S GPS Make & Model Trimble GeoXT

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy < 1 m meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: See GIS data spreadsheet.

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

90 scattered localities in north and east parts of Site & buffer. Generally uncommon, in sandy-gravelly soil, Mojave Desert scrub; Larrea tridentata, Ambrosia dumosa, Sphaeralcea ambigua, Lycium pallidum, Eriogonum trichopes, etc.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: See AFC.

Visible disturbances: Unpaved roads traverse site and buffer.

Threats: See AFC. Salsola sp., Halogeton glomeratus in vicinity.

Comments: Dates of fieldwork: April 16-19, 21, 23, 26-30, 2011. 90 separate localities were mapped, with a total of 440 individuals.

Determination: (check one or more, and fill in blanks)

- ☒ Keyed (cite reference): Jepson Desert Manual
☐ Compared with specimen housed at: _____
☒ Compared with photo / drawing in: Intermountain Flora, Vol 6
☒ By another person (name): Andrew Sanders, UCR
☐ Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	☐	☐	☒
Habitat	☐	☐	☒
Diagnostic feature	☐	☐	☒

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Astragalus nyensis*

Common Name: Nye milkvetch

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 7227 Subsequent Visit? ☐ yes ☐ no

Is this an existing NDDDB occurrence? ☒ no ☐ unk. Yes, Occ. # _____

Collection? If yes: see below UC Riverside
Number Museum / Herbarium

Reporter: Ann Howald, Garcia and Associates

Address: 210 Chestnut Avenue
Sonoma, CA 95476

E-mail Address: annhowald@vom.com

Phone: (707) 721-6120

Plant Information

Phenology: 5 % 90 % 65 %
vegetative flowering fruiting

Animal Information

adults # juveniles # larvae # egg masses # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description (please attach map **AND/OR** fill out your choice of coordinates, below)

Hidden Hills SEGS Site & 250' buffer. North of Old Spanish Trail Hwy, adjacent to CA/NV state line. See AFC for figures showing location of Site and buffer, and localities of this species within Site & buffer.

County: Inyo Landowner / Mgr.: Private

Quad Name: Calvada Springs, Mound Spring Elevation: approx 2640 ft

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S GPS Make & Model Trimble GeoXT

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy < 1 m meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: See GIS data spreadsheet.

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

196 localities in east half of Site & adjacent buffer. Common, in sandy-gravelly soil, Mojave Desert scrub; *Larrea tridentata*, *Ambrosia dumosa*, *Krameria erecta*, *Atriplex canescens*, *Sphaeralcea ambigua*, *Lycium pallidum*, *Gutierrezia microcephala*, *Eriogonum trichopes*, etc.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: See AFC.

Visible disturbances: Unpaved roads traverse site and buffer.

Threats: See AFC. Salsola sp., Halogeton glomeratus, Malcolmia africana in vicinity.

Comments: Dates of fieldwork: April 16-19, 21, 23, 26-30, 2011. 196 separate localities were mapped, with a total of 7227 individuals. Collections by Andrew Sanders: 39178, 39184, 39194 etc., UCR Herbarium

Determination: (check one or more, and fill in blanks)

- ☒ Keyed (cite reference): Flora of Nevada, Kartesz 1988
☐ Compared with specimen housed at: _____
☒ Compared with photo / drawing in: CalPhotos, Jim Andre
☒ By another person (name): Andrew Sanders, UCR
☐ Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	☐	☐	☒
Habitat	☐	☐	☒
Diagnostic feature	☐	☐	☒

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Astragalus preussii* var. *preussii*

Common Name: Preuss' milkvetch

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 7 Subsequent Visit? ☐ yes ☐ no

Is this an existing NDDDB occurrence? ☒ no ☐ unk. Yes, Occ. # _____

Collection? If yes: see below UC Riverside
Number Museum / Herbarium

Reporter: Ann Howald, Garcia and Associates

Address: 210 Chestnut Avenue
Sonoma, CA 95476

E-mail Address: annhowald@vom.com

Phone: (707) 721-6120

Plant Information

Phenology: _____% vegetative 100% flowering 100% fruiting

Animal Information

adults # juveniles # larvae # egg masses # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Hidden Hills SEGS Site & 250' buffer. North of Old Spanish Trail Hwy, adjacent to CA/NV state line. See AFC for figures showing location of Site and buffer, and localities of this species within Site & buffer.

County: Inyo Landowner / Mgr.: Private

Quad Name: Calvada Springs Elevation: approx 2620 ft

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S GPS Make & Model Trimble GeoXT

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy < 1 m meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: See GIS data spreadsheet.

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Three localities incl 2 in southeast quarter of Site, and 1 in western part of buffer. Uncommon, in light-colored silty soil; *Atriplex confertifolia*, *Larrea tridentata*, *Ambrosia dumosa*, *Hoffmannseggia glauca*, *Atriplex canescens*, *Lycium pallidum*, *Gutierrezia microcephala*, etc.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: See AFC.

Visible disturbances: Unpaved roads traverse site and buffer.

Threats: See AFC. Salsola sp., Halogeton glomeratus, Malcolmia africana in vicinity.

Comments: Dates of fieldwork: April 16-19, 21, 23, 26-30, 2011. 3 separate localities were mapped, with a total of 7 individuals. Collections by Andrew Sanders: 39182, 39191. UCR Herbarium

Determination: (check one or more, and fill in blanks)

- ☒ Keyed (cite reference): Jepson Desert Manual 2002
☐ Compared with specimen housed at: _____
☒ Compared with photo / drawing in: Jepson Desert Manual
☒ By another person (name): Andrew Sanders, UCR
☐ Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	☐	☐	☒
Habitat	☐	☐	☒
Diagnostic feature	☐	☐	☒

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Astragalus tidiestromii*

Common Name: Tidestrom's milkvetch

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 3382 Subsequent Visit? ☐ yes ☐ no

Is this an existing NDDDB occurrence? ☒ no ☐ unk. Yes, Occ. # _____

Collection? If yes: see below UC Riverside
Number Museum / Herbarium

Reporter: Ann Howald, Garcia and Associates

Address: 210 Chestnut Avenue
Sonoma, CA 95476

E-mail Address: annhowald@vom.com

Phone: (707) 721-6120

Plant Information

Phenology: 5 % 75 % 95 %
vegetative flowering fruiting

Animal Information

adults # juveniles # larvae # egg masses # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Hidden Hills SEGS Site & 250' buffer. North of Old Spanish Trail Hwy, adjacent to CA/NV state line. See AFC for figures showing locations of Site and buffer, and localities of this species within Site & buffer.

County: Inyo Landowner / Mgr.: Private

Quad Name: Calvada Springs, Mound Spring Elevation: approx 2620 ft

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S GPS Make & Model Trimble GeoXT

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy < 1 m meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: See GIS data spreadsheet.

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

94 localities, mainly in the eastern half of the Site & buffer. Locally scarce to common, in sandy-gravelly to light-colored silty soils. Mojave Desert scrub w/ Larrea tridentata, Ambrosia dumosa, Hoffmannseggia glauca, Atriplex canescens, Atriplex confertifolia, Lycium pallidum, Sphaeralcea ambigua, Gutierrezia microcephala, etc.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: See AFC.

Visible disturbances: Unpaved roads traverse site and buffer.

Threats: See AFC. Salsola sp., Halogeton glomeratus, Malcolmia africana, Bromus rubens in vicinity.

Comments: Dates of fieldwork: April 16-19, 21, 23, 26-30, 2011. 94 separate localities were mapped, with a total of 3382 individuals. Collections by Andrew Sanders: 39175, 39181, 39187 etc. UCR Herbarium

Determination: (check one or more, and fill in blanks)

- ☒ Keyed (cite reference): Jepson Desert Manual 2002
☒ Compared with specimen housed at: UC Riverside
☒ Compared with photo / drawing in: Jepson Desert Manual
☒ By another person (name): Andrew Sanders, UCR
☐ Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	☐	☐	☒
Habitat	☐	☐	☒
Diagnostic feature	☐	☐	☒

May we obtain duplicates at our expense? yes ☐ no ☐

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811

Fax: (916) 324-0475 email: CNDDDB@dfg.ca.gov

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Chaetadelpa wheeleri*

Common Name: Wheeler's skeletonweed

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 1191 Subsequent Visit? ☐ yes ☐ no

Is this an existing NDDDB occurrence? ☒ no ☐ unk. Yes, Occ. # _____

Collection? If yes: see below UC Riverside
Number Museum / Herbarium

Reporter: Ann Howald, Garcia and Associates

Address: 210 Chestnut Avenue
Sonoma, CA 95476

E-mail Address: annhowald@vom.com

Phone: (707) 721-6120

Plant Information

Phenology: 90 % 10 % 0 %
vegetative flowering fruiting

Animal Information

adults # juveniles # larvae # egg masses # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Hidden Hills SEGS Site & 250' buffer. North of Old Spanish Trail Hwy, adjacent to CA/NV state line. See AFC for figures showing location of Site and buffer, and localities of this species within Site & buffer.

County: Inyo Landowner / Mgr.: Private

Quad Name: Calvada Springs, Mound Spring Elevation: approx 2640 ft

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S GPS Make & Model Trimble GeoXT

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy < 1 m meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: See GIS data spreadsheet.

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

85 localities, mainly in the eastern one-fourth of the Site & buffer. Scattered, locally scarce to common, in sandy-gravelly soil. Mojave Desert scrub w/ *Larrea tridentata*, *Ambrosia dumosa*, *Atriplex canescens*, *Krameria erecta*, *Lycium pallidum*, *Sphaeralcea ambigua*, *Gutierrezia microcephala*, *Stanleya pinnata*, etc.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: See AFC.

Visible disturbances: Unpaved roads traverse site and buffer.

Threats: See AFC. Salsola sp., Halogeton glomeratus, Malcolmia africana, Bromus rubens in vicinity.

Comments: Dates of fieldwork: April 16-19, 21, 23, 26-30, 2011. 85 separate localities were mapped, with a total of 1191 individuals. Collection by Andrew Sanders: 39087. UCR Herbarium

Determination: (check one or more, and fill in blanks)

- ☒ Keyed (cite reference): Jepson Desert Manual 2002
☐ Compared with specimen housed at: _____
☒ Compared with photo / drawing in: Jepson Desert Manual
☒ By another person (name): Andrew Sanders, UCR
☐ Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	☐	☐	☒
Habitat	☐	☐	☒
Diagnostic feature	☐	☐	☒

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Cymopterus multinervatus*

Common Name: purplenerve springparsley

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 1 Subsequent Visit? ☐ yes ☐ no

Is this an existing NDDDB occurrence? ☒ no ☐ unk. Yes, Occ. # _____

Collection? If yes: see below UC Riverside
Number Museum / Herbarium

Reporter: Ann Howald, Garcia and Associates

Address: 210 Chestnut Avenue
Sonoma, CA 95476

E-mail Address: annhowald@vom.com

Phone: (707) 721-6120

Plant Information

Phenology: 0 % 0 % 100 %
vegetative flowering fruiting

Animal Information

adults # juveniles # larvae # egg masses # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Hidden Hills SEGS Site & 250' buffer. North of Old Spanish Trail Hwy, adjacent to CA/NV state line. See AFC for figures showing location of Site and buffer, and localities of this species within Site & buffer.

County: Inyo Landowner / Mgr.: Private

Quad Name: Calvada Springs Elevation: approx 2640 ft

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: ☐ H ☐ M ☐ S GPS Make & Model Trimble GeoXT

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy < 1 m meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: See GIS data spreadsheet.

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

One individual, in the southeastern part of the Site. In sandy-gravelly soil. Mojave Desert scrub w/ Larrea tridentata, Ambrosia dumosa, Atriplex canescens, Krameria erecta, Lycium pallidum, Sphaeralcea ambigua, Gutierrezia microcephala, Stanleya pinnata, etc.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: See AFC.

Visible disturbances: Unpaved roads traverse site and buffer.

Threats: See AFC. Salsola sp., Halogeton glomeratus, Malcolmia africana, Bromus rubens in vicinity.

Comments: Dates of fieldwork: April 16-19, 21, 23, 26-30, 2011. One individual. Collected offsite in vicinity by Andrew Sanders. UCR Herbarium

Determination: (check one or more, and fill in blanks)

- ☒ Keyed (cite reference): Jepson Desert Manual 2002
☐ Compared with specimen housed at: _____
☒ Compared with photo / drawing in: Intermountain Flora
☒ By another person (name): Andrew Sanders, UCR
☐ Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	☐	☐	☒
Habitat	☐	☐	☒
Diagnostic feature	☐	☐	☒

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Eriogonum bifurcatum*

Common Name: Pahrump Valley buckwheat

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 15,346 Subsequent Visit? ☐ yes ☐ no

Is this an existing NDDDB occurrence? ☒ no ☐ unk. Yes, Occ. # _____

Collection? If yes: see below UC Riverside
Number Museum / Herbarium

Reporter: Ann Howald, Garcia and Associates

Address: 210 Chestnut Avenue
Sonoma, CA 95476

E-mail Address: annhowald@vom.com

Phone: (707) 721-6120

Plant Information

Phenology: 20% vegetative 20% flowering 60% fruiting

Animal Information

adults # juveniles # larvae # egg masses # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Hidden Hills SEGS Site & 250' buffer. North of Old Spanish Trail Hwy, adjacent to CA/NV state line. See AFC for figures showing location of Site and buffer, and localities of this species within Site & buffer.

County: Inyo Landowner / Mgr.: Private

Quad Name: Calvada Springs, Mound Spring Elevation: approx 2600 ft

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ GPS Make & Model Trimble GeoXT

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy < 1 m meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: See GIS data spreadsheet.

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

68 localities, scattered throughout western half of Site & buffer. Locally common; on desert pavement and in light-colored silty soil. Shadscale Scrub; Atriplex confertifolia, Atriplex canescens, Lycium spp., Kraschennikovia lanata, Sphaeralcea ambigua, Gutierrezia microcephala, Stanleya pinnata, Hoffmannseggia glauca etc.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: See AFC.

Visible disturbances: Unpaved roads traverse site and buffer.

Threats: See AFC. Salsola sp., Halogeton glomeratus, Malcolmia africana, Bromus rubens in vicinity.

Comments: Dates of fieldwork: April 16-19, 21, 23, 26-30, 2011. 68 localities with 15,346 individuals. Collections by Andrew Sanders: 38627, 38642, 39094 etc. UCR Herbarium

Determination: (check one or more, and fill in blanks)

- ☒ Keyed (cite reference): Jepson Desert Manual 2002
☐ Compared with specimen housed at: _____
☒ Compared with photo / drawing in: Jepson Desert Manual 2002; Knight 1986
☒ By another person (name): Andrew Sanders, UCR
☐ Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	☐	☐	☒
Habitat	☐	☐	☒
Diagnostic feature	☐	☐	☒

May we obtain duplicates at our expense? yes ☐ no ☐

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Phacelia pulchella* var. *gooddingii*

Common Name: Goodding's phacelia

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 33,933 Subsequent Visit? ☐ yes ☐ no

Is this an existing NDDDB occurrence? ☒ no ☐ unk. Yes, Occ. # _____

Collection? If yes: see below UC Riverside
Number Museum / Herbarium

Reporter: Ann Howald, Garcia and Associates

Address: 210 Chestnut Avenue
Sonoma, CA 95476

E-mail Address: annhowald@vom.com

Phone: (707) 721-6120

Plant Information

Phenology: 5 % 90 % 10 %
vegetative flowering fruiting

Animal Information

adults # juveniles # larvae # egg masses # unknown
☐ ☐ ☐ ☐ ☐
wintering breeding nesting rookery burrow site other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Hidden Hills SEGS Site & 250' buffer. North of Old Spanish Trail Hwy, adjacent to CA/NV state line. See AFC for figures showing location of Site and buffer, and localities of this species within Site & buffer.

County: Inyo Landowner / Mgr.: Private

Quad Name: Calvada Springs, Mound Spring Elevation: approx 2620 ft

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ GPS Make & Model Trimble GeoXT

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy < 1 m meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: See GIS data spreadsheet.

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

297 localities, widespread and common throughout Site & buffer. Locally common; on desert pavement, and in light-colored silty soil to silty-sandy soil. Mojave Desert Scrub and Shadscale Scrub; Larrea tridentata, Ambrosia dumosa, Atriplex confertifolia, Atriplex canescens, Lycium spp., Kraschenninikovia lanata, Sphaeralcea ambigua, Gutierrezia microcephala, Stanleya pinnata, Hoffmannseggia glauca etc.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: See AFC.

Visible disturbances: Unpaved roads traverse site and buffer.

Threats: See AFC. Salsola sp., Halogeton glomeratus, Malcolmia africana, Bromus rubens in vicinity.

Comments: Dates of fieldwork: April 16-19, 21, 23, 26-30, 2011. 297 localities with 33,933 individuals. Collections by Andrew Sanders: 39258, 39266, etc. UCR Herbarium

Determination: (check one or more, and fill in blanks)

- ☒ Keyed (cite reference): Jepson Desert Manual 2002
☐ Compared with specimen housed at: _____
☒ Compared with photo / drawing in: Jepson Desert Manual 2002; CalPhotos - Jim Andre
☒ By another person (name): Andrew Sanders, UCR
☐ Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	☐	☐	☒
Habitat	☐	☐	☒
Diagnostic feature	☐	☐	☒

May we obtain duplicates at our expense? yes ☐ no ☐

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811

Fax: (916) 324-0475 email: CNDDDB@dfg.ca.gov

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Selinocarpus nevadensis*

Common Name: desert wing-fruit

Species Found? ☒ Yes ☐ No If not, why? _____

Total No. Individuals 63 Subsequent Visit? ☐ yes ☐ no

Is this an existing NDDDB occurrence? ☒ no ☐ unk. Yes, Occ. # _____

Collection? If yes: see below UC Riverside
Number Museum / Herbarium

Reporter: Ann Howald, Garcia and Associates

Address: 210 Chestnut Avenue
Sonoma, CA 95476

E-mail Address: annhowald@vom.com

Phone: (707) 721-6120

Plant Information

Phenology: 75% 25% 25%
vegetative flowering fruiting

Animal Information

adults # juveniles # larvae # egg masses # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description (please attach map **AND/OR** fill out your choice of coordinates, below)

Hidden Hills SEGS Site & 250' buffer. North of Old Spanish Trail Hwy, adjacent to CA/NV state line. See AFC for figures showing location of Site and buffer, and localities of this species within Site & buffer.

County: Inyo Landowner / Mgr.: Private

Quad Name: Calvada Springs Elevation: approx 2600 ft

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H ☐ M ☐ S ☐ GPS Make & Model Trimble GeoXT

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy < 1 m meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ OR Geographic (Latitude & Longitude) ☐

Coordinates: See GIS data spreadsheet.

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

13 localities, all in the southwest quarter of the Site. Uncommon; silty-sandy-gravelly soil, some plants in shallow depressions. Mojave Desert Scrub and Shadscale Scrub; Larrea tridentata, Ambrosia dumosa, Atriplex confertifolia, Atriplex canescens, Lycium spp., Kraschennikovia lanata, Sphaeralcea ambigua, Gutierrezia microcephala, Stanleya pinnata, Hoffmannseggia glauca etc.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: See AFC.

Visible disturbances: Unpaved roads traverse site and buffer.

Threats: See AFC. Salsola sp., Halogeton glomeratus, Malcolmia africana, Bromus rubens in vicinity.

Comments: Dates of fieldwork: April 16-19, 21, 23, 26-30, 2011. 13 localities with 63 individuals. Collections by Andrew Sanders: 39265, 39267. UCR Herbarium

Determination: (check one or more, and fill in blanks)

- ☒ Keyed (cite reference): Jepson Desert Manual 2002
☐ Compared with specimen housed at: _____
☒ Compared with photo / drawing in: Jepson Desert Manual 2002
☒ By another person (name): Andrew Sanders, UCR
☐ Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	☐	☐	☒
Habitat	☐	☐	☒
Diagnostic feature	☐	☐	☒

May we obtain duplicates at our expense? yes ☐ no ☐

Attachment B4-1
Records of Conversation

CH2MHILL TELEPHONE CONVERSATION RECORD

Call To: Heather Beeler
Regional Eagle Permit Biologist
US Fish and Wildlife Service
Sacramento, CA

Phone No.: (916) 414-6464 **Date:** September 07, 2011

Call From: Marble, James/SCO **Time:** 04:29 PM

Message Taken By:

Subject: Eagle Nest Helicopter
Surveys for Hidden Hills
SEGS

Project No.: 420246

I described to Ms. Beeler our plan to conduct golden eagle (GOEA) surveys while avoiding take of Nelson's bighorn sheep (NBS). I confirmed that California Department of Fish and Game had warned that NBS breeding populations occupy the Nopah Range and the Kingston Range near the HHSEGS site. CDFG said that over flights by helicopters are likely to result in take of NBS. I explained that, consequently, we had conducted a pedestrian survey for GOEA nests in May of 2011 and that we planned to follow with a helicopter survey this fall, to identify any raptor nests that had not been identified in the pedestrian survey. I explained that we plan to conduct pedestrian protocol nest surveys in the late winter and spring of 2012 focusing on any nest sites identified in the fall helicopter survey. I asked if the Service would value the data collected in a fall helicopter nest survey and would consider it worthwhile.

Ms. Beeler expressed approval of this plan. She stated that the helicopter surveys, although outside of the nesting season, would be useful, especially considering the limitations on pedestrian surveys due to the terrain of the area. She said that a contact for GOEA permits has not been identified in USFWS Nevada.

She asked for a summary of this conversation to place in the files.

CH2MHILL® TELEPHONE CONVERSATION RECORD

Call To: Ashleigh Blackford, Biologist and Acting Assistant Field Supervisor on behalf of Carl Benz, US Fish and Wildlife Service, Ventura, California.

Phone No.: (805) 644-1766 ext. 234 **Date:** September 19, 2011

Call From: James Marble **Time:** 11:30 A.M.

Message Taken By:

Subject: USFWS Contacts and Information Relating to CEC Data Adequacy Request Revision 1
Hidden Hills SEGS AFC

Project No.: 420246

I called Mr. Benz, but he was unavailable. Ms. Blackford was designated as Acting Assistant Field Supervisor in place of Mr. Carl Benz. I left her a voice message and later sent her an email.

Return call at 4:15 P.M.

Ms. Blackford said that the appropriate contact for biological issues is Mr. Ray Bransfield, Senior Biologist (805-644-1766 extension 317). He is out of the office this week.

She said that they have no requirement for compensatory mitigation for desert kit fox. She said that she believes that CDFG has protocols to avoid direct impacts to desert kit fox.

She said that they do not have any requirements for Nelson's bighorn sheep, since this is not the listed Peninsular DPS. The USFWS refers project proponents to CDFG if there is a possibility of lambing populations in the area of golden eagle nest surveys.

CH2MHILL TELEPHONE CONVERSATION RECORD

Call To: Brad Hardenbrook
Supervising Habitat Biologist
Nevada Department of Wildlife (NDOW)
Las Vegas, Nevada

Phone No.: (702) 486-5127 ext. 3600 **Date:** September 08, 2011

Call From: Marble, James/SCO **Time:** 11:00 A.M.

**Message
Taken By:**

Subject: Hidden Hills SEGS Golden Eagle Helicopter Nest Surveys and Bighorn
Sheep Lambing Strategy

Project No.: 420246

I called Mr. Hardenbrook to confirm the legal status of Nelson's bighorn sheep (*Ovis canadensis nelsoni*) (NBS) in Nevada. I also asked about any prohibitions against helicopter eagle nest surveys during NBS lambing.

He confirmed that there is no legal bar, but that it is a bad idea and NDOW discourages it.

I described our strategy to conduct helicopter surveys in the fall, after lambs are weaned, and to follow up by conducting two protocol pedestrian surveys in the spring focusing on nests identified in the helicopter survey.

He said that NDOW staff have discussed this issue with other agencies and internally. Last year they developed a protocol with SWCA for a wind farm. It allowed helicopter surveys after the third week in April. However, this depended on the weather last year and may not be acceptable in other years.

He said the NDOW will begin their annual helicopter survey of bighorn sheep soon and suggested that we coordinate with that Christy Klinger, the NDOW raptor specialist.

He said that he would talk to his staff and call back later in the day.

3:00 P.M.: Return call.

Mr. Hardenbrook said that Christy Klinger, the NDOW raptor specialist, (christy@ndow.org (702) 486-5127 ext. 3212) approves of our strategy. She was involved in developing the SWCA strategy. The following people were also involved in developing the SWCA strategy:

Pat Cummings, NDOW, southern Nevada bighorn sheep biologist (702) 486-5127 ext. 3717

Brian Novosak, USFWS eagle contact in Nevada (Brian_Novosak@usfws.gov 702 775-5230)

CH2MHILL® TELEPHONE CONVERSATION RECORD

Call To: Craig Bailey, CDFG, Fresno, California

Phone No.: (559) 243-4014 ext. 261

Date: September 21, 2011

Call From: Jim Marble

Time: 2:50 P.M.

Message Taken By:

Subject: Desert Kit Fox Protection and Avoidance Measures

Project No.: 420246

Mr. Bailey is not the designated by CDFG to work with this project but provided general information.

He cited protection for the desert kit fox under Title 14 California Code of Regulations § 460, which states, "Fisher, marten, river otter, desert kit fox and red fox may not be taken at any time."

He said that, consequently, there is no legal mechanism to issue a permit to take desert kit fox. Avoidance measures must be implemented.

Avoidance measures are developed on a project-specific basis. Some measures used for other projects have included the following:

- Establishment of a 500-foot buffer and a corridor accessing foraging habitats, 500-feet wide, during the denning season, when pups are present.
- Hand excavation of vacant burrows.

Mr. Bailey stated that some of the measures employed to avoid San Joaquin kit fox may be appropriate for the desert kit fox.

CH2MHILL® TELEPHONE CONVERSATION RECORD

To: Wendy Campbell, Biologist, California Department of Fish and Game, Bishop, California

Phone No.: (760) 872-1171

Date: September 20, 2011

Call From: James Marble

Time: 10:00 A.M.

Message Taken By:

Subject: CDFDG Contacts and Information Relating to CEC Data Adequacy Request
Hidden Hills SEGS AFC

Project No.: 420246

I explained to Ms. Campbell that CEC referred us to her. I said we need to talk about a variety of topics including a streambed alteration agreement, 2081 permit, golden eagle, bighorn sheep, migratory birds, kit fox and compensatory mitigation.

Ms. Campbell said that she is no longer assigned to projects in Inyo County but only to those in Kern County. She said that she did not know who will be assigned to projects in Inyo County. She referred me to Bruce Kinney, Deputy Regional Manager. However, she said that he is out of the office and unavailable until next week.

Marble, James/SCO

From: Marble, James/SCO
Sent: Tuesday, September 20, 2011 10:25 AM
To: 'bkinney@dfg.ca.gov'
Cc: Carrier, John/SAC
Subject: Hidden Hills Solar Project

Mr. Kinney,

Ms. Wendy Campbell told me that she is no longer assigned to the Hidden Hills solar project by BrightSource Energy. It is located in Inyo County adjacent to the State border in the Pahrump Valley.

I need to consult with CDFG on wildlife matters related to the project.

They include Golden Eagle, bighorn sheep, migratory birds and kit fox.

Please let me know who is the appropriate contact.

Thank you,

Jim Marble, Ph.D.
Senior Biologist
CH2M HILL
6 Hutton Centre Drive
Santa Ana, CA 92707-5735
Direct: (714) 435-6208
x36208



CH2MHILL TELEPHONE CONVERSATION RECORD

Call To: Jeff Brandt/CDFG LSAA Program

Phone No.: 909-987-7161

Date: September 22, 2011

Call From: Kathy Rose/SAC

Time: 4:30 PM

Subject: Hidden Hills SEGS, Need for CDFG LSAA

I contacted Jeff Brandt, Senior Environmental Scientist with the CDFG LSAA program, for Region 6 – Inland Desert Region. The purpose of the call was to determine if it is likely that CDFG would claim jurisdiction over the drainages that were delineated on the Hidden Hills site; how CDFG would define their jurisdictional limits in this area; and what procedures they recommend for delineating streams within their jurisdiction.

While Jeff Brandt works in the LSAA program for the CDFG Inland Deserts region, he develops Streambed Alteration Agreements for projects in Riverside County. He made it clear that Inyo County is not his responsibility, and the Bishop field office should be contacted. I let him know that we have had not success with reaching the appropriate staff in the Bishop field office, and appreciated him answering generic questions regarding jurisdiction.

I explained that the HHSEGS project was in Inyo County, on the California-Nevada border but within the state of California. I let him know that total acreage of waters that were delineated is minimal compared to the overall size of the project; most water features are poorly defined and only a few inches deep; and we believe the USACE may take jurisdiction over a few of the drainages that are larger and cross state lines.

Regarding whether or not CDFG would claim jurisdiction, Mr. Brandt responded, "Yes." He recommends being conservative and assuming that CDFG would take jurisdiction over all of the drainages, not just the few we believe may be regulated by the Army Corps.

Regarding limits of jurisdiction, he responded that the CDFG jurisdiction could be greater than the ordinary high water mark (OHWM) that defines the limit of USACE jurisdiction. He indicated that their jurisdiction would include the bank-to-bank extent, and, in addition, would extend to the outer edge of any associated vegetation, including alluvial fan sage scrub.

Regarding procedures for mapping, he responded that procedures would generally be the same as are used for delineating waters of the U.S., with the exception that the jurisdictional limits would be defined as stated above.

Mr. Brandt informed me that he would let staff in the CDFG Bishop field office know that he talked to me and that he provided the above information to me.

Attachment B4-2
Burrowing Owl Field Survey Forms

SENSITIVE WILDLIFE Sign (live, burrows, scats, carcasses, etc.)

INCLUDE BADGER, BURROWING OWL, MAMMAL BURROW COMPLEXES, RAPTORS, BIG HORN SHEEP, FRINGE-TOED LIZARD

Detection number	GPS location		Type of sign (live, burrows, scats, carcass, etc.)	Description and comments	Photo Reference
Easting	Northing				
20APR 11	597 520	39 85 625	Badger burrow	steep burrow in good condition. .5-1m deep	No photo
20APR 11	598 559	39 85 399	Badger burrow	steep burrow in poor condition. Many annuals present. .5-1m deep.	No photo
20APR 11	598 084	39 85 389	Badger burrow	steep burrow in fair condition. However it may have been used this year.	Badger-1-HH
20APR 11	598 101	39 85 729	Burrowing owl whitewash, Pellets, and feathers.	1-1.5m deep. White wash found outside a single conical burrow. 2+ pellets inside the burrow and 1 outside burrow. Feathers inside burrow. Burrow in fair condition w/annuals in runway. Burrow 1-1.5m deep	B-Owl-4-HH B-Owl-5-HH
20APR 11	598 153	39 85 791	Burrowing Owl Whitewash	White wash found outside a single conical burrow. Burrow is in fair condition with annuals present on runway. 5-1m deep.	No photo
20APR 11	598 330	39 85 780	Burrowing Owl White wash and pellets	White wash found outside single conical burrow. 2 pellets found in burrow. Burrow is in fair condition w/annuals present on runway. 1-1.5m deep. Can't see back.	B-Owl-1-HH B-Owl-2-HH B-Owl-3-HH
20APR 11	597 453	39 85 617	Burrowing Owl White wash	White wash found outside a single conical burrow. Burrow is in fair condition. 1-1.5m deep.	No photo
21APR 11	598 292	39 85 200	Burrowing Owl White wash and pellets	White wash found outside a single conical burrow. 1 pellet inside burrow and 1 pellet outside burrow. Burrow is in fair condition w/annuals on runway. .5-1m deep.	No photo

SENSITIVE WILDLIFE Sign (live, burrows, scats, carcasses, etc.)

INCLUDE BADGER, BURROWING OWL, MAMMAL BURROW COMPLEXES, RAPTORS, BIG HORN SHEEP, FRINGE-TOED LIZARD

Detection number	GPS location		Type of sign (live, burrows, scats, carcass, etc.)	Description and comments	Photo Reference
	Easting	Northing			
189 ✓ 26 APR 11	600	094	3983375	Burrowing owl pellet and white wash	B-Owl-6-HH
4128 ✓ 29 APR 11	601	181	3982411	Burrowing owl 2 pellets and white wash	B-Owl-7-HH
1163 ✓ 6 MAY 11	597	554	3982741	Burrowing owl pellets white wash, feathers	B-Owl-8-HH
1166 ✓ 9 MAY 11	598	868	3983304	Badger burrow	B-Owl-9-HH
178 ✓ 10 MAY 11	598	425	3983549	Badger burrow	B-Owl-10-HH
1180 ✓ 10 MAY 11	598	903	3983610	Badger burrow	B-Owl-11-HH
1184 ✓ 10 MAY 11	597	550	3983546	Badger burrow	B-Owl-12-HH
1186 ✓ 10 MAY 11	597	719	3983667	Badger burrow	B-Owl-13-HH
1190 ✓ 10 MAY 11	599	128	3983641	Badger burrow	B-Owl-14-HH
1192 ✓ 11 MAY 11	598	157	3983808	Badger burrow	B-Owl-15-HH
202 ✓ 12 MAY 11	597	514	3984200	Burrowing owl white wash + pellets. Canid burrow.	B-Owl-16-HH
203 ✓ 12 MAY 11	597	549	3984201	Badger burrow	B-Owl-17-HH

SENSITIVE WILDLIFE Sign (live, burrows, scats, carcasses, etc.)
INCLUDE BADGER, BURROWING OWL, MAMMAL BURROW COMPLEXES, RAPTORS, BIG HORN SHEEP, FRINGE-TOED LIZARD

HIDDEN HILLS RANCH SOLAR PROJECT-SPRING 2011 SURVEY

at

5.3 Cultural Resources

B1. Summary of Region Ethnology & Prehistory [Appendix B(g)(2)(A)]

A summary of the ethnology, prehistory, and history of the region with emphasis on the area within no more than a 5-mile radius of the project location.

Information required for the AFC to conform to the regulations:

a. **Prehistory:** The synthesis of the general prehistory of the Mojave Desert as a whole is sufficient as a broad introduction to the archaeology of the project area, but is insufficient to underpin the development of any research model for the pedestrian survey of the project area or as a useful context to facilitate in the interpretation of the survey results. Using the Mojave Desert prehistory as a springboard and using the cultural resources technical reports and site forms that were gathered for the appendices of the AFC, please develop a discussion of the prehistoric archaeology of the immediate project area vicinity. Explain what the archaeology looks like on the ground in the vicinity of the project area.

Contrary to the applicant's assertion in the September 2011 supplement to their AFC that our regulations do not require the information that staff sought on the prehistoric archaeology of the more immediate vicinity of the project area, the regulations specifically state that the summary of prehistory must have an "emphasis on the area within no more than a 5-mile radius of the project location." The summary provided, as previously stated, is a broad introduction to the prehistory of the Mojave as a whole. Absent is any discussion of how the broad prehistoric overview applies to the immediate (5-mile radius) project vicinity or site, including what type of archaeology might be found in the immediate vicinity.

As previously requested, please develop a discussion of the prehistoric archaeology of the immediate project area, within a 5-mile radius of the project location. This discussion should incorporate the information in the cultural resources technical reports and site forms that were gathered for the appendices of the AFC.

b. **Ethnology:** The prefilming meeting held on August 2 with the local Native American groups, specifically the Pahrump Band of Paiute and Las Vegas Paiute Tribe, clearly indicated a spiritual connection with the Pahrump Valley and the project site. The tribal members present indicated that different bands of Paiute have traditionally utilized the area, and the AFC indicates other groups were also utilizing the area. The ethnology needs to consider (a) the use of the area by each group individually; (b) how the different groups may have interrelated; (c) how the land was being used (resource identification and utilization) and what the physical manifestations of these uses may have been or are; and (d) the religious/spiritual significance of the project site and Pahrump Valley (immediate region) to the various peoples using it. The tribal members present also indicated that burials or cremations are present; a discussion of the local Native American traditions for the disposal of the dead and likely physical remains needs to be included. Additional discussion of how the project may impact the areas in proximity to, but outside the footprint of the project site, areas that have been used traditionally by the various groups, also needs to be included.

As is the case for prehistory (see above), our siting regulations also require a summary of the ethnology of the project area region “within no more than a 5-mile radius of the project location.” The summary of the ethnology in the AFC does not convey this information. Staff requests that the applicant redraft the ethnology summary to address (a) the use of the area by each relevant ethnic group individually; (b) how the different groups may have interrelated; (c) how the land was being used (resource identification and utilization) and what the physical manifestations of these uses may have been or are; and (d) the religious/spiritual significance of the project site and Pahrump Valley (immediate region) to the various peoples using it, as this information relates to that 5-mile area surrounding the project location. Sources for this information may include, but are certainly not limited to, published and peer-reviewed academic literature, written or oral Native American narratives, and discussions with Native Americans, such as the August 2, 2011 meeting with the Las Vegas and Pahrump bands of the Paiute.

Response— The section below supplements Section 5.3.3 of the AFC and Appendix 5.3, Cultural Setting.

Prehistory of the Northern Mojave Desert

Of the many chronological sequences proposed for the project area, two primary regional syntheses have been commonly used for the southern California deserts and the adjoining southwestern Great Basin:¹ Warren (1968, 1984) and Warren and Crabtree (1986). Warren (1968, 1984) and Warren and Crabtree (1986) define five periods: Lake Mojave, Pinto, Gypsum, Saratoga Springs, and Protohistoric. In 2007, however, a new synthesis of cultural prehistory in the Mojave Desert was presented by Sutton et al. (2007), which includes results from 20 years of extensive fieldwork conducted in the Mojave Desert by various individuals and groups. Sutton et al. (2007) divides the Mojave Desert prehistory into four periods: Pleistocene, Early Holocene, Middle Holocene, and Late Holocene, adopting the chronostratigraphic nomenclature employed by Quaternary geologists and paleoecologists working in the area (e.g., Quade et al., 1995; Spaulding, 1985). Each period is further subdivided into complexes generally based on Warren (1984) and Warren and Crabtree (1986). The discussion below is based largely on the new work conducted since 1986 and a relatively newly proposed chronology (Sutton et al., 2007). See Table B1-1 for a brief comparison of these three chronologies.

None of the chronologies discussed here begin prior to end of the Pleistocene circa 12,000 B.P. (years before present). And while several sites in both North and South America now appear unequivocally to date to earlier times, and although the Sutton et al. (2007) chronology includes a hypothetical Pre-Clovis Complex, no sites from this period are currently documented in the Mojave Desert. A small faction of the archaeological community has proposed a Pre-Clovis occupation of the Mojave Desert, but much of this data remains unsubstantiated (Sutton et al., 2007). The Tule Springs investigations (Wormington and Ellis, 1967) in the Las Vegas Valley about 45 miles to the east-northeast on the other side of the Spring Mountains, included large and systematic excavations aimed at recovering evidence of terminal Pleistocene peoples in this region. No definitive evidence was found for a human presence here during that time.

¹ The southwestern Great Basin culture area includes the floristically defined Mojave Desert.

TABLE B1-1
Cultural Chronologies Proposed for the Mojave Desert

Approximate Age	Sutton et al. (2007), Mojave Desert		Warren (1984), Southern California Desert	Warren and Crabtree (1986), Southwestern Great Basin	Associated Artifacts
	Temporal Period	Cultural Complex	Cultural Period	Cultural Period	
Up to 10,000 B.C.	Pleistocene	Pre-Clovis (Hypothetical)			Unknown
10,000–8000 B.C.		Paleo-Indian	Clovis	Clovis	Fluted points
8000–6000 B.C.	Early Holocene	Lake Mojave	Lake Mojave	Lake Mojave	Stemmed points
6000–2000 B.C.	Middle Holocene	Pinto			Pinto points
		Deadman Lake (currently 29 Palms only)	Pinto	Pinto	Contracting stem and leaf-shaped points
2000 B.C. to A.D. 1100	Late Holocene	Gypsum	Gypsum	Gypsum	Gypsum and Elko Series points
A.D. 200–1100		Rose Springs	Saratoga Springs	Saratoga Springs	Rose Spring and Eastgate Series points
A.D. 1200–Contact		Late Prehistoric	Protohistoric	Shoshonean	Desert Series points, ceramics

In the following discussion the principal cultural complexes associated with the terminal Pleistocene and early, middle, and late Holocene periods in the Mojave Desert are described. It is important to note that these complexes were time-transgressive to the extent that, for example, the Pinto Complex appears to have originated during the early Holocene but extended throughout the subsequent middle Holocene.

Paleo-Indian Period (Approximately 12,000 to 8000 cal B.C.)

The Paleo-Indian Period covers the interval from the first accepted presence of humans in southern California desert and southwestern Great Basin in the late Pleistocene until approximately 8000 cal B.C. (calibrated years before Christ). Artifacts and cultural activities from this period represent a predominantly hunting culture; diagnostic artifacts include large, often fluted bifaces associated with use of the spear and the atlatl. Populations appeared to have been relatively small and highly mobile, living in temporary camps near readily available water. Evidence for Clovis occupation in the Mojave Desert is currently limited to isolated points and a single site at China Lake that is presumed to be an occupation site (Sutton et al., 2007). Other ancient sites that appear associated with pluvial lakes, such as those along the terminal Pleistocene shorelines of pluvial Lake Mojave (Rogers, 1939; Warren and Crabtree, 1986), while often referred to

as Paleo-Indian, are assigned to the next youngest period in this classification (see below).

Lake Mojave Complex (8000 to 6000 cal B.C.)

In the deserts of southern California and the southwestern Great Basin, the earliest substantive remains of human occupation are found along the shoreline of ancient Lake Mohave in the central Mojave Desert about 50 miles south-southeast of the HHSEGS project area (Sutton et al., 2007; Warren and Crabtree, 1986). The Lake Mohave Period (approximately 8000 to 6000 cal B.C.) is associated with the waning phases of now-dry pluvial lakes found throughout the Great Basin, and considered a regional expression of the Western Pluvial Lakes Tradition. Artifacts observed at Lake Mojave Period sites include stylized dart points of the Lake Mohave² and Silver Lake series, well-made bifacial knives and other cutting tools, large domed scrapers or scraping planes, crescents, occasional cobble core tools, and ground stone implements (Wallace 1962; Sutton et al., 2007). Flaked stone artifacts, which make up the largest part of the toolkit, are often formal tools made of non-local materials, while ground stone tools, present in far smaller numbers, generally show ephemeral wear, thus suggesting long-term curation of more easily carried items, and less reliance on vegetal resources. Site types include extensive habitation sites, small camps, and workshops along the recessional shorelines of now-dry pluvial lakes. In addition to sites known in the Lake Mojave area, a goodly density of Lake Mojave Period artifact assemblages are known at Fort Irwin, about 90 miles southwest of the HHSEGS project area (Sutton et al., 2007).

Pinto Complex (7000 to 3000 cal B.C.)

The Pinto Complex may be the mostly widely distributed of the early complexes in the Mojave Desert. It occurs in a wide variety of topographic and environmental zones, including near remnant pluvial lake basins, near abandoned stream channels, close to springs or seeps, as well as in upland areas. The earliest dated site in the Pahrump Valley, the Manse Ranch Site, dates to the Pinto Period (Bunch, 2003). Large Pinto Complex sites with deep middens and a wide range of artifact types appear to correlate with stable water sources. In some parts of the Mojave Desert, a temporal overlap is noted between the Lake Mojave Complex and the Pinto Complex. Recent early radiocarbon dates from Fort Irwin, Twentynine Palms, and the Garlock Fault site in Kern County range from 8340 cal B.C. to 6300 cal B.C., indicating the possible development of the Pinto Complex in the Early Holocene, rather than neatly corresponding to the end of the Lake Mojave Complex. There appears to be continuity of flaked stone technologies from one complex to the next, including the material selection of locally available stone and use of bifacial and unifacial tool forms. Other than differences in point style, a main distinction between the two periods appears to be the number of ground stone tools found at Pinto sites in comparison to the relative paucity of ground stone tools found at Lake Mojave sites. High levels of ground stone found at Pinto sites indicates that the emergence of intensive plant exploitation began by

² Although Warren and Crabtree (1986) discuss the “Lake Mojave Period” (emphasis added), their presentation of artifacts associated with this period designates them the “Lake Mohave Complex”, including “Lake Mohave points.” For consistency we have chosen to use the more geographically appropriate “Mojave” alone.

approximately 7000 cal B.C., before the Altithermal or middle Holocene thermal maximum (Spaulding, 1991; Sutton et al., 2007).

Pinto sites are found in a wide range of environments, and the inferred flourishing of new economies, including greater plant-resource exploitation, is seen both in the desert and on the coast. *Olivella* shell beads have been found with Pinto sites, indicating the beginnings of trade with the coast. Diagnostic artifacts recovered from Pinto Period archaeological sites include heavy-keeled scrapers, flat millingstones, manos, and Pinto series projectile points, which are large, relatively coarsely made points, indicating the continued use of darts and atlatls (Warren, 1984). The Manse Ranch Site, which is known to have a Pinto component, is located approximately 10 miles north of the HHSEGS site (Bunch, 2003; Smith, 2007). During the middle Holocene, conditions in the Mojave Desert had become much hotter and much drier. By the end of the Middle Holocene, there is little available archaeological data and currently, few sites are known to date to the period between 3000 and 2000 cal. B.C., as parts of the Mojave appear to have been abandoned. This abandonment appears likely due to the contraction of water resources to a few areas, and reduction of ecosystem productivity in general during an arid period in a region already famed for its aridity (Spaulding, 1991; Jones et al., 2004; Sutton et al., 2007).

Gypsum Complex (2000 cal B.C. to cal A.D. 200)

The start of the Gypsum Complex coincides with the end of the Middle Holocene period of maximum aridity at approximately 2000 cal B.C. Despite the paucity of sites dating to this period, the first extensive evidence for contact between the desert and the coast dates to the Gypsum Period. Southwestern influence in the California deserts is also observed (Warren, 1984; Sutton et al., 2007). *Olivella* shell beads and *Haliotis* rings were apparently traded in from the coast. Split twig figures from the Colorado Plateau are also found at Gypsum sites. Gypsum Complex toolkits include the diagnostic Elko and Elko eared points, elongate triangular-based Gypsum Points, rectangular-based knives, flake scrapers, T-shaped drills, the occasional large scraper plane, and hammerstones (Moratto, 1984). A shift in food procurement strategies marks this period. Grinding implements, including manos and millingstones, became common and mortars and pestles were introduced (Warren, 1984).

New procurement strategies and regular trade contact with peoples living on the coast provided stability to desert dwellers of the Gypsum Complex. The impact of fluctuations in Late Holocene climatic conditions, including excursions to more arid periods, may have been buffered by these cultural developments. Despite periodic excursions to a warmer, drier climate that may have lasted for centuries, populations did not decrease in the deserts at the end of the Middle Holocene (Sutton et al., 2007).

Rose Spring Complex (A.D. 200 to 1100)

Attributes of the Rose Spring Complex display a strong coastal influence extending into the western Mojave Desert and Antelope Valley (Warren 1984). The bow and arrow moved into the Mojave Desert at this time. Evidence for a significant population increase and rather dramatic changes in artifact assemblages characterize the Rose Spring Complex in the western Mojave (Sutton et al., 2007). Within the southwestern Great

Basin, including the northern Mojave Desert, this period is also referred to as the Saratoga Springs Period (Warren, 1984; Warren and Crabtree, 1986). During this period, the influence of the Basketmaker III and Pueblo development spreads into the eastern Mojave Desert. The HHSEGS project area is located at a crossroads of the influence of both the California coast to the west, and the Anasazi of the Colorado Plateau to the east (Warren and Crabtree, 1986).

Generally, the Rose Spring Complex appears to display continuity with the Gypsum Complex. Similar artifacts, such as millingstones, manos, mortars, pestles, and incised stones are still used. Desert populations continued a successful hunting and gathering adaptation to the desert environment through increasingly complex subsistence strategies. Technological innovation, especially the introduction of the bow and arrow, accompanied this trend. These sites contain a variety of trade items, including southern California shell beads, steatite items, and other coastal artifacts. Eastgate and Rose Spring projectile points are diagnostic artifacts (Sutton et al., 2007).

Rose Spring sites are found near springs, washes, and occasionally dry lake shores. Architectural evidence of pit houses, wickiups, and other types of structures indicate an increase in sedentism during this period. However, the hyperarid climatic episodes accompanying the Medieval Climatic Anomaly began during the Rose Springs Complex. The resulting desiccation of lakes and other water sources in the Mojave Desert, as well as reduction in ecosystem productivity, appears to have significantly changed settlement patterns, resulting in a shift to a dependence on a few geographically restricted permanent water sources, rather than more dispersed and ephemeral water sources (which dried up). Jones and others (2004) discuss the geographic patterns of population reduction and aggregation in the central and western Mojave Desert that accompanied enhanced aridity during the Medieval Climatic Anomaly. The Rose Springs Complex extends to about A.D. 1100.

Late Prehistoric Complexes (A.D. 1100 to Historic Period)

During this period, there was a strong reliance on plant food gathering and hunting of small game, and a decreased reliance on large game (Warren, 1984). Within the southeastern Great Basin, including the northern Mojave Desert, the Late Prehistoric Period incorporates the Shoshonean Period (Warren and Crabtree, 1986). Separate complexes emerged that appear to represent the advent of currently recognizable ethnographic groups. Anasazi turquoise mining and Hakatayan influence moved west from the Colorado River early during this period. Somewhat later the Numic-speaking peoples historically identified as the Paiute, Shoshone, and Ute spread east and north from southern California through the Mojave Desert (Madsen and Rhode, 1994). Seasonal movement was common to take advantage of the phenology of different plant resources (e.g., pinyon harvesting in the fall, agave harvesting in the early summer, grass- and annual-seed gathering in the spring), resulting in a diverse array of site types. Characteristic artifacts include Desert series and Cottonwood projectile points, buffware and brownware ceramics, shell and steatite beads, and milling tools. Trade continued to develop and expand with groups on the coast, as well as with groups to the east.

The Archaeology of the Pahrump Valley and the HHSEGS Site

Records Search Results

Additional information regarding archaeology specific to the Pahrump Valley was sought in various archaeological literature sources including journals and books, in accounts of historic surveyors and explorers to the region, and at the Harry Reid Center in Las Vegas, Nevada. Specific sources are cited in the text below. Additional on-line searches were conducted in the archives of the *Pahrump Valley Times* as well as in the National Register Information System for Inyo County, California, and Nye and Clark Counties, Nevada. The following summary is largely taken from the research conducted at the Harry Reid Center; very little information specific to the Pahrump Valley was available via other sources.

Archaeological sites in the Mojave Desert often consist only of surface manifestations such as lithic scatters and rock features, and frequently lack datable deposits. The lack of datable deposits means archaeologists frequently rely on artifacts that have been placed into broad temporal periods (Grenda, 1997). Generally, small sites such as those observed at the HHSEGS site represent one to a few episodes of activity. However, these activities are often isolated and present a body of data that is not necessarily colored by the complexities of a larger site (Glassow, 1985). Additionally, small sites can represent a range of activities often not found at larger more complex sites, including resource procurement or processing.

Several privately documented prehistoric campsites were informally reported at the Hidden Hills Ranch by the owner, Roland Wiley, in the 1970s. No formal documentation of these resources was allowed by the owner; however, University of Nevada, Las Vegas staff were allowed onsite to observe and photograph these sites, which were noted to contain lithics, archaic projectile points, crescents, and Kayenta and Paiute pottery (Knight and Leavitt, 2003). A possible historic era cemetery is also located on the Nevada side of the Hidden Hills Ranch. In an oral interview with a local historian, the cemetery was described as a part of Roland Wiley's attempts to turn the Hidden Hills Ranch into a tourist attraction reminiscent of Boot Hill in Tombstone, Arizona. The cemetery was described by the historian as fabricated mock graveyard. However, based on oral interviews with the caretaker of the Hidden Hills Ranch and a member of the Pahrump Band of the Southern Paiute, the cemetery was described as a 1920s graveyard. Occupants of this cemetery were identified as a mix of at least one European, and between 2 and 17 Paiutes and Shoshone, all of whom died in the 1920s. The European, generally agreed to be one of the Yount family, was either exhumed and reburied on the California side of the border or never placed in the cemetery at all depending on the interviewee. The cemetery has not been definitively identified as containing human remains in the modern era (Seymour, 1998). A historic wagon road was found during a 2004 survey that appears to connect the Hidden Hills Ranch with Trout Canyon (Knight and Leavitt Associates, 2004).

Isolated roasting pits were found during surveys near the HHSEGS site (Seldomridge, 1988). Lithic scatters, roasting pits, cleared circles, and rock rings are noted in lower parts of the Pahrump Valley. Rockshelters and rock art have been recorded in the mountainous areas around the valley (Knight et al. 1984; Myhrer, 1994). One prehistoric

habitation site with midden, lithics, and ceramics is recorded at Mound Spring (Green and Brennan, 1980), about 6 miles north of the project area. The remains of an adobe are recorded here, as well. This adobe was likely a station along the Old Spanish Trail – Mormon Road (OST-MR) and possibly represents the remains of the Old Owens Ranch. This site is located at one of the remaining spring mounds once widely distributed along fault lineaments in the Pahrump Valley (e.g., Quade et al., 1995). Two additional prehistoric habitation sites with midden, roasting pits, and burials are located on the old Manse Ranch. One of these sites, the Bowman site, is located adjacent to an extinct, artesian-fed stream bed and less than a mile from another spring mound, the Bolling Mound. Water expelled from the Manse Spring was known to create ponds in the modern era; this likely occurred in the past, as well (Smith, 2007). The Bowman site contains ceramics which appear to be Paiute brown ware, as well as obsidian. One burial at the Bowman Site contained a Puebloan Black Mesa black-on-white bowl. Projectile point types were found that dated from the Middle Holocene to the Late Holocene. The Bolling Mound habitation site is located approximately a mile from the Bowman Site, still on the Manse Ranch at the Bolling Mound Spring. Surface artifacts at this site indicated Southern Paiute occupation in the Late Holocene and the earliest deposits included a Pinto point (Smith, 2007). Excavations at the Bolling Mound and Bowman habitation sites north of the HHSEGS site indicate that the occupation of the Pahrump Valley began at least as early as during the Pinto Period and continued into the Historic Period (Bunch, 2003; Smith, 2007).

Another prehistoric habitation site is recorded at Stump Spring. This site contains several roasting pits, lithics, ceramics, flaked tools, fire affected rock, and a single marine-shell bead. The ceramics are identified as Puebloan specific to the Virgin-Branch Anasazi (White and Myhrer, 1989). The remains of an adobe are present here as well, and the site is situated along the OST-MR corridor. Agave (*Agave utahensis*) and pinyon (*Pinus monophylla*) processing sites are recorded in Trout Canyon in the Spring Mountains, 15 miles northeast of the project area. Other sites found in Trout Canyon contain lithics, groundstone, and ceramics (Knight and Leavitt Associates, 2004). The other mountains surrounding the Pahrump Valley are low, desert ranges without the woodland resources of the massive Spring Mountains to the east. It is therefore reasonable to expect that seasonal rounds directed at resource procurement would have been frequently directed to the Spring Mountains.

Relevant Site Types and Their Expression in the Project Area

A quarry or lithic procurement site is a location where the primary activity consisted of procuring material for stone tools. Quarry sites may be extensive and involve the mining of lithic material, or the site may be an area where cobbles from outcrops were opportunistically tested for suitability for its lithic reduction (or flaking) qualities. Such areas are sometimes referred to as lithic prospects (Wilke and Schroth, 1989), describing a site where toolstone was occasionally acquired. These prospects are much smaller than quarries, and often the material is poor quality toolstone. Quarry pits, where digging to obtain unweathered source material are more typical of sites with high-quality toolstone, are not to be expected at prospects. Heat-treated stone is not common. Hammerstones are not often found, either. In areas where there is not a source of quality toolstone, however, prospects are often quite plentiful and could be the most common

lithic procurement site (Wilke and Schroth, 1989). These prospects supplemented less regular excursions to large quarries with good material. Generally, neither quarry sites nor prospect sites contain ceramics, bedrock milling, or faunal material (Gramly, 1980). Larger quarries would likely contain a wide variety of artifact types as the source material is plentiful and broken tools are easily replaced. Old, worn-out tools are frequently found discarded at quarry sites. Predominately primary flakes, a low density of flakes, and for the most part a low quality, naturally occurring toolstone source were noted at the majority of the lithic scatter sites within the HHSEGS site. Temporally diagnostic artifacts were not found during the survey.

Lithic procurement sites can be described as either direct procurement or embedded procurement. Direct procurement collectors make special trips to acquire toolstone, while embedded procurement describes collection of toolstone during excursions to gather other resources (Bamforth, 2002). Binford describes lithic procurement as an embedded practice. Toolstone is acquired when available during other procurement activities, rather than during special long-distance trips to known quarries (Binford, 1979). Bamforth (1987) notes in a comparison of quarrying techniques at desert pavement quarry sites from the Early periods against similar quarries from the later periods that there are no observable technology changes in source selection, reduction strategies, or artifact form (Bamforth, 1987). Rather, differences at quarries appear to be related to the degree of mobility. Less mobile populations exploited areas more heavily; more mobile populations less so. And even in this instance, these differences are often related only to the rate at which a site is utilized rather than a change in procurement strategies. Other contributors would be distance to water sources and the amount of raw material available for knapping at a procurement site (Bamforth, 1987). Also, toolstone collectors would need to decide what is more practical and economical in collection practices: more time at the procurement site or a heavier load? Greater distances would likely necessitate more processing time (Beck et al., 2002). Toolstone collectors who travel short distances would be less likely to spend time in the field processing the toolstone.

Generally, lithic procurement sites appear to represent single or limited reduction episodes associated with opportunistic toolstone procurement. There appears to be a strong correlation between the distance to a source and the reduction stages of lithic debris observed at a quarry or lithic prospect (Shott, 1986). Additionally, extensive studies of lithic procurement in New Mexico suggest that direct procurement of lithic material is predominately based on site-to-source distances (Harro, 1997). Frequently, locally available lithic material is utilitarian and rather ubiquitous. Within the HHSEGS area, lithic materials appear to be readily obtainable; it is not high quality material but easily acquired. Artifacts found at quarry or lithic procurement sites can offer insight into stone-working goals as well as re-tooling activities (Giambastiani, 2008), whether lithic procurement is embedded or direct, and can offer insight into residential mobility as well as regional settlement adaptations.

Many of the small lithic scatters found at the HHSEGS could be aptly described as lithic prospects. Only limited testing and possible removal of acceptable material appears to have occurred at these sites. The source material at these locations is limited to anomalous igneous clasts found within the HHSEGS site and vicinity. Giambastiani

(2008) describes lithic procurement sites with major toolstone deposits in the Mojave Desert as occurring in two types of settings: bedrock outcrops and desert pavements. Giambastiani (2008) further describes the commonalities of Mojave lithic procurement sites. The majority of recorded pavement quarry sites in the Mojave generally contain cryptocrystallines, although basalt and rhyolite are also found. Raw cobbles of the toolstone material are found at these sites. Little to no evidence of any other activities are extant and there is generally at least one discrete concentration of flaked stone debris found onsite (Giambastiani, 2008). Non-quarrying tools largely include simple but well-used flake tools. Giambastiani (2008) also includes a discussion of the subsurface component for several Mojave pavement quarry sites located near Twentynine Palms, California. These subsurface components are found at the discrete lithic reduction loci within the lithic procurement sites. Giambastiani (2008) hypothesizes that the subsurface components are related to two variables based on observations at the above-mentioned sites: the actual composition of the desert pavement and the quantity of flaked stone debris within the reduction area. Generally, larger flakes were observed on the surface of the reduction area, while the subsurface components consisted of smaller flakes.

A single rock cairn was found during the survey; however, no artifacts were found associated with this cairn and it is unclear how old this cairn is. The cobbles comprising this cairn had been placed in such a way as to expose to weathering the carbonate rind coating their original bottoms. The extent of carbonate dissolution on those rocks since the cairn was constructed strongly suggests a prehistoric age for the cairn, consistent with the manner in which the lowest course of rock has settled into the soil.

Often rock cairns and small packed gravel circles are frequently found by rock alignments (Davis and Winslow, 1965). Rock cairns have been recorded either as a part of archaeological sites or as isolated features. They are found associated with both prehistoric and historic archaeological sites. They occur isolated or in groups of up to a hundred (Taylor et al., 1987). Ethnographic evidence for the creation of rock cairns during a shaman's vision quest have been noted (Whitley, 2001: 96). Along the coast, cairns are found associated with Millingstone burials (Wallace, 1955; Moratto, 1984). Rock cairn burials in the Mojave Desert date from 5000 B.P. to historic times (Taylor et al., 1987). Historic Paiute used rock cairns to cache food along trails (Steward, 1938). Taylor et al. (1987) proposes the following classifications for prehistoric cairn uses: burial cairns, or cairns placed over a pit containing a flexed inhumation; cache cairns, or cairns covering a layer of grass which hid a food cache; and single or grouped cairns that do not appear to serve a specific purpose (Taylor et al., 1987). Another hypothesis regarding rock cairns was developed from observations of early agriculture in the Negev Desert. Cairns were the byproduct of rock removal to create catchment basins along ephemeral drainages for irrigating crops. Researchers in Arizona found some evidence for the use of rock mounds to collect water for stimulating growth of agave plants (Taylor et al., 1987). Rock cairns have also been heavily employed by miners and prospectors to mark their claims, both historically and in modern times.

Use of the HHSEGS site appears to be fairly limited to opportunistic lithic procurement by mobile groups who traversed the area en route to various springs and other areas with resources. Aside from the small lithic procurement sites in the HHSEGS area, only a rock cairn and a roasting pit were identified. Both of these features are known to have

been employed by the Southern Paiute; rock cairns were known to be used as food caches and roasting pits were known to be used to process mescal or agave. Both of these activities also indicate the presence of mobile groups passing through on foraging rounds and seem plausible uses. Additionally, the presence of larger, more complex habitation sites is known to be extant at nearby springs.

Ethnography

HHSEGS is situated in a border region between territories inhabited by the Southern Paiute and the Panamint, a Western Shoshone group. The Chemehuevi also ventured into the areas near the project.

The Southern Paiute peoples and the Chemehuevi belong to the Southern Numic branch of the Uto-Aztecan language family. The first historic observations of the Southern Paiute were made by fathers Escalante and Dominguez in 1776. The fathers observed Paiute homesteads and farms along the Colorado River, and small maize fields watered with river water that flowed through irrigation ditches. Subsequent expeditions through the area recorded similar observations regarding Paiute agriculture, adding that melon and squash were also cultivated (Stoffle and Zedeno, 2001).

Sixteen identifiable groups of the Southern Paiute, sometimes called “bands,” formerly occupied a broad strip of territory from southern Utah and southern Nevada and along the west side of the Colorado River into southern California. The Chemehuevi along the Colorado River were strongly influenced culturally by the Mohave, who lived to the east across the Colorado River (Kelly and Fowler, 1986:368). Overall, the Chemehuevi territory was one of the largest areas in California with a uniform dialect (Kroeber, 1925). The Chemehuevi recognized local divisions among themselves. However, the sociopolitical organization of the Southern Paiute groups, including the Chemehuevi, was not centralized. Additionally, boundaries for each group appear to have been relatively fluid and permeable. Groups consisted of individual households that variously coalesced and dispersed during the year to facilitate different economic pursuits. Favored residence locations adjacent to springs or agricultural plots were held as private property and subject to inheritance. Large household clusters often had a headman, whose authority was more advisory than authoritative (Kelly and Fowler, 1986:380).

Both the Chemehuevi and the Southern Paiute practiced some limited agriculture. They also practiced a hunting and gathering subsistence. Small game, such as rabbits, rodents, birds, chuckwallas, a large lizard of rocky habitats, and tortoises, were important to subsistence in this part of the desert; larger game such as deer and desert bighorn sheep, which were more prevalent in the uplands, did not appear to supplement their diet significantly. Pinyon pine nuts, seeds, berries, and roots were basic staples. They were thought to cultivate corn, squash and gourds, pumpkins, sunflowers, and winter wheat in the limited areas where perennial water existed in this desert region: the floodplains of the Virgin and Colorado rivers, and where artesian springs provided plentiful discharge, such as in the Las Vegas Valley. The adoption of farming did not appear to have significantly altered the seasonally mobile way of life; the elderly generally stayed to tend crops while most of the population undertook its seasonal hunting and gathering forays (Kelly and Fowler, 1986:371).

The Chemehuevi and Southern Paiutes made both twined and coiled basketry items, including vessels, hats, and cradles (Kelly and Fowler, 1986:375). Kroeber (1925:597) noted that many artistic attributes were painted onto rather than woven into some basketry items. The Chemehuevi and the Las Vegas area Southern Paiute made pottery that seems to have mimicked Mohave styles. Their pottery technology was more developed than among other Southern Paiute groups and was used to create cooking and storage vessels, water jars, scoops or spoons, and large pots for ferrying children across rivers. They also constructed log rafts and reed balsas for river transport (Kelly and Fowler, 1986:377). Houses were simple frames with reeds, constructed to function only as shelters. Sweathouses were not constructed at Chemehuevi villages (Kroeber, 1925).

By the late nineteenth and early twentieth centuries, the majority of the Southern Paiutes were confined to reservations on largely marginal lands. Termination of the reservations by the federal government in the 1950s left most of the Southern Paiutes in deplorable conditions. Subsequent settlements of suits for compensating the Native Americans for their lands provided little more than temporary windfalls. Some reservations were restored and have established various business enterprises with mixed success. Some vestiges of aboriginal culture have survived, but much of the language has largely died out. By 1980, only 124 Chemehuevi were recorded living in California (Kelly and Fowler, 1986:391-392).

Panamint Shoshone

The Western Shoshone territory extended from Death Valley in California through central and northern Nevada into northwestern Utah. The Panamint, a group within the Western Shoshone, spoke a language that was Central Numic, rather than Shoshone and thus, are sometimes referred to as only Panamint (Thomas et al., 1986).

The Shoshone used a number of different strategies to procure necessary resources in a demanding desert environment. Frederick Vernon Coville, a botanist, observed in 1891 that the Panamint of Death Valley would spend the summers at high elevations in the mountains and descend during the winter into the valley below (Coville, 1892). Although the Panamint practiced some limited agriculture using irrigation, the majority of their food was collected or hunted. The main staple was the pinyon nut, but other seeds, including grass seeds, were also gathered when available. Animals, including rabbits, birds, chuckwalla, woodrats, kangaroo rats, mice, and occasionally desert bighorn sheep and deer, were hunted. Other plant foods such as prickly pear, devil's pincushion, Joshua tree leaves, and the berries from the *Lycium andersonii* bush were also consumed (Coville, 1892). Family groups foraged through the spring into the fall. During the winter months, however, villages made up of several of these family groups were established near water sources and food caches (Thomas et al., 1986).

Panamint structures were likely similar to other Shoshone structures. A typical winter house was a conical structure with a light frame and covered with bark (Thomas et al., 1986). Winter villages contained a sweathouse; Panamint sweathouses were also conical. Baskets were woven using willow and the roots of Joshua trees. Baskets were used for cooking and water transport. Bows were made of juniper and arrows were constructed

of reed stems and willow shoots. Points for arrows were made of stone and hard wood (Coville, 1892).

Life rituals were performed at birth, death, and when girls reached puberty. Girls' puberty rites were fairly widespread among Shoshone, including the Panamint. The Panamint cremated their dead. The Shoshone recognized three types of shamans: shamans who could cure specific ailments, shamans who used their abilities for their own benefit only, and shamans who were able to effect general cures (Thomas et al., 1986).

The Western Shoshone were among the last groups in the continental United States to be affected by European settlers. In 1863, the Western Shoshone signed the Treaty of Ruby Valley and agreed to move onto reservation land when provided and to give up nomadic life. Land was set aside for reservations in 1900. During the 1930s, several of the Western Shoshone groups joined together and elected a traditional council to interact with the U.S. Government. The U.S. Government did not recognize this group as a legal tribe and organized a government sponsored council, which was not popular with the Western Shoshone. They formed the United Western Shoshone Legal Defense and Education Association in 1974 and presented their interests and concerns to the Indian Claims Commission. The Indian Claims Commission ruled that the Western Shoshone had lost their land in 1863. They were paid \$26 million for the lost land, approximately one dollar an acre, but the tribe appealed and the case was eventually heard before the U.S. Supreme Court. The Court ruled that the monies paid in 1979 extinguished their title to the land (Thomas et al., 1986).

The tribe became federally recognized in 1983, but received no land until 2000. The Timbisha Homeland Act of 2000 transferred 7,500 acres of the Death Valley National Park to the Timbisha Shoshone thus creating the Timbisha Reservation. In 2004, the Western Shoshone Claims Distribution Act was signed and the Western Shoshone were awarded payment for their lands (Timbisha Shoshone Tribe, 2003).

The Ethnography of the Pahrump Valley

The Pahrump Valley is situated in a region that overlaps the traditional lands of the Panamint, a Western Shoshone group, and the Southern Paiute. The Pahrump Valley was described by Wheeler in 1872 as dotted with springs; many of these were spring mounds near which the Southern Paiute groups resided. Many of the springs were owned by individual Paiute groups and the Paiute were uncommon among other desert groups in that individual groups could claim ownership to springs (Fowler, 2002). Modern Paiute report that the area was a traditional hunting ground for desert tortoise. Southern Paiute historically associated with the Pahrump Band also report that the area was a traditional hunting ground, and that during years of high spring discharge at least the area around Stump Spring, about 6 km to the east, was the site of farming "green corn and yellow melons," as well as dances during the harvest season. When historic surveyors passed through the area in the late 1800s they observed that the Paiute in the area grew corn, melons, and squashes, especially pumpkins, in the areas where artesian springs provided sufficient runoff for irrigation. The Paiute of the Pahrump Valley were observed planting small amounts of corn, beans, and pumpkins before continuing on their foraging rounds. They would return when the crops were ready for harvesting.

Wild grapes were noted as well around the springs (Wheeler, 1872; Kelly 1934). Modern era archaeological excavations at the Bowman site, in Southern Paiute territory, provided insight into historic and prehistoric land use of the area, as well. Historic grape seeds were found in a cache at the site. Pine nut shells as well as catclaw and juniper seeds, apparently collected from higher elevations and transported back to the local spring, were found in collected soil samples. Squash, cucumber, and gourd were also found during excavations (Smith, 2007).

Similar to the Paiute, the Panamint practiced a form of limited agriculture. In the latter half of the 1800s, travelers in the area, including a geographical survey party (Wheeler, 1872) and a biological survey party (Coville, 1892) noted that the local groups practiced some irrigation and cultivation of small plots of land. Common crops were corn, potatoes, squashes, and watermelons.

Hunted animals included rabbits, quail, small rodents, and chuckwalla, a large lizard of rocky habitats. The pinyon nut, which is harvested in October from the woodland that occurs in the larger mountains,³ at altitudes of 6000 to 8000 feet above mean sea level, comprised a large portion of consumed starch. Cones are beaten from the trees in early fall and sun dried. Large quantities are collected and cached in dry places. The nuts are roasted before eating. Seeds are collected from a number of sources. Sand grass provides seeds which are gathered with a basket and a large paddle. The berries from the lycium bush are collected, also. Seeds are collected from cacti, such as the Devil's pincushion and the paddles, buds, and immature fruit of one type of prickly pear are collected and dried. These are cooked in hot stones, grass, and earth and then, salted for consumption. Historic miners report that when food is scarce among the Panamint, almost any green plant is eaten after boiling. Mesquite beans are dried and pounded into flour to make small cakes or loaves. Among the Panamint, Joshua trees are consumed in a manner similar to agave or mescal. The buds are removed in early spring and roasted. Similarly, the Southern Paiute were observed consuming mescal, after steaming in grass covered and rock lined pits (Coville, 1872).

Accounts exist of Shoshone and Paiute informants who describe temporary camps of groups consisting often of entire families that will maintain camp for many days as many as 10 to 20 miles from water, provided there are resources that make the stay worthwhile. Seeds, salt, and lithic materials were considered worthwhile goods (Heizer and Kroeber, 1976). Review of the scant pertinent literature did not identify any quarry sites in the Pahrump Valley, yet the occupants of the valley would have required at least some toolstone. Archaeological data indicates toolstone in the Pahrump Valley was acquired opportunistically. In areas where there is not a source of quality toolstone, however, prospects are often quite plentiful and could be the most common lithic procurement site (Wilke and Schroth 1989). These prospects could have supplemented less regular excursions to large quarries with good material. Generally, these sites appear to represent a single or limited reduction episodes associated with opportunistic toolstone procurement. There appears to be a strong correlation between the distance to

³ The Panamint Range immediately west of Death Valley, and the Spring Mountains immediately east of Pahrump Valley, are relatively large mountain ranges that support extensive stands of pinyon. Most other mountain ranges in the vicinity are too small to support significant woodland.

a source and the reduction stages of lithic debris observed at a quarry or lithic prospect (Shott, 1986).

Frequently, locally available lithic material is utilitarian and rather ubiquitous, which appears to be true within the Pahrump Valley. Some toolstone appears readily obtainable in the area; it is not high quality material but easily acquired throughout the valley. It consists of chert nodules incorporated into the coarser facies of the alluvial fans extending into the project area from the Spring Mountains to the east, and less frequent casts of basalt and andesite. Sandstone slabs of sufficient size to use as grinding stones would have been obtainable on the alluvial fans closer to the Spring Mountains. Devils Peak, in the southern Spring Mountains about 32 miles to the southeast, was a regionally utilized source of obsidian.

During the August 2, 2011 visit to the HHSEGS site, a Paiute elder noted that their traditional songs incorporated the various landforms of the Pahrump Valley and its surrounds, as well as their significance. The Southern Paiute traditional birthplace was noted by the elder as the Spring Mountains which, at altitudes exceeding 10,000 feet, stands over the entire valley, and figures prominently in songs that talk about the landscape and the tribal source of energy and history. Portions of a Deer Song are related by a Paiute ethnographer, Isabel Kelly in 1933, which describes how to hunt deer, the best places in the valley to hunt deer, and the names of the different places deer will travel, among other things. The song was traditionally sung by different singers and there were different versions. Proper singing among the Southern Paiute was clearly a very important way to transmit their history and legends. Other songs included the Talk Song and the Salt Song, which described the travels of a wandering bird and the travels of two sisters, respectively (Fowler, 2002). These two songs, which are mourning songs, illustrate the extensive range of the Southern Paiute, well outside of their home range (Fowler, 2002) and into the ranges of other groups.

Southern Paiute moved with the seasons and thus, employed both winter and summer dwellings. The winter house was conical and the door generally faced east. These types of winter homes were partially excavated and possessed four embedded posts. Summer houses consisted of a dome-shaped ramada or a circular brush enclosure (Kelly and Fowler, 1986). They also constructed small shade structures that were circular with a frame of two parallel rows of poles. These structures were constructed of locally available materials. Southern Paiute also constructed special structures called *tiakani* which was likely a small circular dwelling or a circular brush enclosure with a fire inside for the birth of a child. This structure is similar to birthing circles found in other areas (Kelly, 1976).

By the 1880s, much of the labor at the Pahrump and Manse Ranches was supplied by local Southern Paiute. This was not an uncommon practice of European ranchers, Owens Valley Paiute were similarly employed on the land they once owned (McCracken, 2003; Bahr, 2003). Small villages were noted during the 1920's near the Pahrump and Manse Springs and it became more common to send children off to boarding schools such as the Sherman Institute in Riverside County, California, to teach EuroAmerican ways so that young Paiute would have more advantages and be better equipped to the changing times (McCracken, 2003; Bahr, 2003). However, this practice is now widely seen as having contributed to the destruction of the cultural identity of native people, and

inconsistent with the prejudice encountered by these young people both in the schools and after graduation.

References Cited

Bamforth, Douglas B. 1987. Settlement, Raw Material, and Lithic Procurement in the Central Mojave Desert. *Journal of Anthropological Archaeology*. 9:70-104

Bamforth, Douglas B. 2002. The Windy Ridge Quartzite Quarry: Hunter Gatherer Mining and Hunter Gatherer Land Use on the North American Continental Divide. *World Archaeology* 38 (3): 511-527.

Bahr, Diana Meyers. 2003. *Viola Martinez, California Paiute: Living in Two Worlds*. University of Oklahoma Press.

Beck, Charlotte, Amanda K. Taylor, George T. Jones, Cynthia M. Fadem, Caitlyn R. Cook, and Sara A. Millward. 2002. Rocks are Heavy: transport costs and Paleoarchaic quarry behavior in the Great Basin. *Journal of Anthropological Archaeology*. 21(4): 481-507

Binford, Lewis R. 1979. Organization and Formation Processes: Looking at Curated Technologies. *Journal of Anthropological Research*. 35:255-273

Bunch, James H. 2003. A Class III Cultural Resource Survey of Three Material Pit Sources: Searchlight and Pahrump, Clark County, Nevada. Ms. on file, Harry Reid Center, Las Vegas, Nevada.

Coville, Frederick Vernon. 1892. The Panamint Indians of California. *The American Anthropologist*, Volume 5.

Davis, Emma Lou and Sylvia Winslow. 1965. Giant Ground Figures of the Prehistoric Deserts. *Proceedings of the American Philosophical Society*. Vol. 109, No. 1

Fowler, Catherine S. 2002. What's In A Name? Some Southern Paiute Names for Mojave Desert Springs as Keys to Environmental Perception. Conference Proceedings. Spring-fed Wetlands: Important Scientific and Cultural Resources of the Intermountain Region, 2002. <http://www.wetlands.dri.edu>

Giambastiani, Mark A. 2008. Understanding Pavement Quarries in the Mojave Desert. *Avocados to Millingstones: Papers in Honor of D.L. True, Monographs in California and Great Basin Anthropology*. No. 5: 66-90.

Glassow, Michael A. 1985. The Significance of Small Sites to California Archaeology. *Journal of California and Great Basin Anthropology*. 7(1):58-66l.

Gramly, Richard Michael. 1980. Raw Materials Source Areas and "Curated" Tool Assemblages. *American Antiquity*, 45(4): 823-833.

Green, Eileen M. and Lynda M. Brennan. 1980. A Cultural Resource Investigation of the Southern Section of Seismic Line #17 in the Pahrump Valley, Nye County, Nevada and Inyo County, California. Ms. on file, Harry Reid Center, Las Vegas, Nevada

- Grenda, Donn Robert. 1997. Site Structure, Settlement Systems, and Social Organization at Lake Elsinore, California. Unpublished dissertation on file at the University of Arizona, Tucson, Arizona.
- Harro, Douglas R. 1997. Patterns of Lithic Raw Material Procurement on the Pajarito Plateau, New Mexico. Master's Thesis, Washington State University.
- Heizer, Robert F. and Alfred L. Kroeber. 1976. For Sale: California at 47 Cents Per Acre. *The Journal of California Anthropology*. 3(2): 38-65.
- Jones, T. L., G. M. Brown, L. M. Raab, J. L. McVickar, W.G. Spaulding, D. J. Kennett, A. L. York, and P. L. Walker 2004. Environmental Imperatives Reconsidered: Demographic Crises in Western North America During The Medieval Climatic Anomaly. In *Prehistoric California Archaeology and the Myth of Paradise* (edited by L. M. Raab and T. L. Jones) 12-32. The University of Utah Press, Salt Lake City.
- Kelly, Isabel T. 1934. Southern Paiute Bands. *American Anthropologist*. Vol. 36, No. 4.
- Kelly, Isabel T. 1976. Southern Paiute Ethnography in Paiute Indians II. Garland Publishing Inc. New York and London.
- Kelly, Isabel T. and Catherine S. Fowler. 1986. Southern Paiute in Handbook of North American Indians, Great Basin, Volume 11. William C. Sturtevant, General Editor. Smithsonian Institute, Washington D.C.
- Knight and Leavitt Associates, Inc. 2003. A Class III Cultural Resources Inventory of an Access Road from SR-160 in Pahrump Valley, Clark County, Nevada. Ms. on file, Harry Reid Center, Las Vegas, Nevada.
- Knight and Leavitt Associates, Inc. 2004. A Class III Cultural Resource Inventory of an Access Road to a Private Parcel from SR-160 in Pahrump Valley Clark County, Nevada. Ms. on file, Harry Reid Center, Las Vegas, Nevada.
- Kroeber, A.L. 1925. *Handbook of the Indians of California*. Reprinted 1976. Dover Publications, Inc. New York, New York.
- Labbe, Armond J. 1995. *Guardians of the Life Stream*. The Bowers Museum of Cultural Art. Santa Ana, California.
- Madsen, David B. and D. Rhode (eds.). 1994. *Across the West: Human Population Movement and the Expansion of the Numa*. University of Utah Press, Salt Lake City.
- McCracken, Bob. 2003. Pahrump's Link to the Past. Pahrump Valley Times, November 28, 2003.
- Moratto, Michael J. 1984. *California Archaeology*. Academic Press, Inc. San Diego, California.
- Myhrer, Keith. 1994. Inventory for the Pahrump Community Gravel Pit Expansion, Nye County, Nevada. Ms. on file, Harry Reid Center, Las Vegas, Nevada

- Quade, Jay, M. D. Mifflin, W. L. Pratt, W. McCoy, and L. Burckle. 1995. Fossil spring deposits in the southern Great Basin and their implications for changes in water-table levels near Yucca Mountain, Nevada, during Quaternary time. *Geological Society of America Bulletin* 107:213-230.
- Rogers, Malcolm J. 1939. *Early Lithic Industries of the Lower Basin of the Colorado River and Adjacent Desert Areas*. San Diego Museum Papers, No. 3. San Diego, California.
- Seldomridge, Jeffry S. 1988. Nevada Department of Transportation Cultural Resources Report, NDOT-CL043-88P. Ms. on file, Harry Reid Center, Las Vegas, Nevada.
- Seymour, Deni J. 1998. Cultural Resource Survey of 64.3 Acres for a Proposed Access Road for the Front Sight Arms Training Facility Near Pahrump, Clark County, Nevada. Ms. on file Harry Reid Center, Las Vegas, Nevada.
- Shott, Michael. 1986. *Technological Organization and Settlement Mobility: An Ethnographic Examination*. *Journal of Anthropological Research*. 42(1): 15-52
- Smith, Annette Joye (A.J.). 2007. *Organization of Lithic Technology at the Bowman Site (26NY809), Pahrump Valley, Nye County, Nevada*. Master's Thesis, Graduate College, University of Nevada, Las Vegas.
- Spaulding, W. Geoffrey. 1985. *Vegetation and climates of the last 45,000 years in the vicinity of the Nevada Test Site, south-central Nevada*. U. S. Geological Survey Professional Paper 1329. Denver, CO.
- Spaulding, W. Geoffrey. 1991. A middle Holocene vegetation record from the Mojave Desert and its paleoclimatic significance. *Quaternary Research* 35: 427-437.
- Steward, Julian H. 1933 Ethnography of the Owens Valley Paiute. University of California Publications in American Archaeology and Ethnology, Vol. 33, No. 3, pp. 233-350.
- Stoffle, Richard W. and Maria Nieves Zedeno. 2001. Historical Memory and Ethnographic Perspectives on the Southern Paiute Homeland. *Journal of California and Great Basin Anthropology*, 23(2). pp. 229-248.
- Sutton, Mark Q., Mark E. Basgall, Jill K. Gardner, and Mark W. Allen. 2007. Advances in Understanding Mojave Desert Prehistory, In *California Prehistory, Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar. pp. 229-246. AltaMira Press, Lanham.
- Taylor, Thomas T., Dianne L. Taylor, Delbert Alcorn, Edward B. Weil and Martin Tambunga. 1987. Investigations Regarding Aboriginal Stone Mound Features in the Mojave Desert: Excavations at CA-SBr-221 and CA-SBr-3136, San Bernardino County, California. *Papers on the Archaeology of the Mojave Desert*. No. 10.
- Thomas, David Hurst, Lorann S.A. Pendleton, and Stephen C. Cappannari. 1986. Western Shoshone in *Handbook of North American Indians, Great Basin, Volume 11*. William C. Sturtevant, General Editor. Smithsonian Institute, Washington D.C.

Timbisha Shoshone Tribe. 2003. History. Electronic Resource, Accessed September 20, 2011, <http://www.timbisha.org/history.htm>

Wallace, William J. 1955. A Suggested Chronology for Southern California Coastal Archaeology. *Southwestern Journal of Anthropology* 11(3):214-230.

Wallace, William. 1962. Prehistoric Cultural Development in the Southern California Deserts. *American Antiquity*. 28(2):172-180.

Warren, Claude N. 1968. Cultural Tradition and Ecological Adaptation on the Southern California Coast. *Archaic Prehistory in the Western United States, Contributions in Anthropology*, 1(3):1-14.

Warren, Claude N. 1984. The Desert Region. In M.J. Moratto, *California Archaeology*, pp.339-430. Academic Press, Inc, San Diego.

Warren, Claude N. and Robert H. Crabtree. 1986. Prehistory of the Southwestern Area in *Handbook of North American Indians, Great Basin, Volume 11*. William C. Sturtevant, General Editor. Smithsonian Institute, Washington D.C.

Wheeler, George Montague. 1872. Annual Report Upon the Geographical Explorations and Surveys West of the One Hundredth Meridian. Washington Government Printing Office.

White, William G. and Keith Myhrer. 1989. Site Record for NV-CK-301. Ms. on file, Harry Reid Center, Las Vegas, Nevada.

Whitley, David S. 2001. *The Art of the Shaman: Rock Art in California*. The University of Utah Press. Salt Lake City.

Wilke, Philip J. and Adella B. Schroth. 1989. Lithic Raw Material Prospects in the Mojave Desert, California. *Journal of California and Great Basin Anthropology*. 11(2): 146-174

Wormington, H. M. and D. Ellis. 1967. *Pleistocene studies in southern Nevada*. Nevada State Museum Anthropological Papers 13. Carson City.

B2. Research Design [Appendix B(g)(2)(C)]

The results of new surveys or surveys less than 5 years old shall be provided if survey records of the area potentially affected by the project are more than five (5) years old. Surveys to identify new cultural resources must be completed by (or under the direction of) individuals who meet the Secretary of the Interior's Professional Standards for the technical area addressed.

New pedestrian archaeological surveys shall be conducted inclusive of the project site and project linear facility routes, extending to no less than 200' around the project site, substations and staging areas, and to no less than 50' to either side of the right-of-way of project linear facility routes. New historic architecture field surveys in rural areas shall be conducted inclusive of the project site and the project linear facility routes, extending no less than .5 mile out from the proposed plant site and from the routes of all above-ground linear facilities. New historic architecture field surveys in urban and suburban areas shall be conducted inclusive of the project site, extending no less than one parcel's distance from all proposed plant site boundaries. New historic architecture field reconnaissance ("windshield survey") in urban and suburban areas shall be conducted along the routes of all linear facilities to identify, inventory, and characterize structures and districts that appear to be older than 45 years or that are exceptionally significant, whatever their age.

A technical report of the results of the new surveys, conforming to the Archaeological Resource Management Report format (CA Office of Historic Preservation Feb 1990), which is incorporated by reference, shall be separately provided and submitted (under confidential cover if archaeological site locations are included).

Information included in the technical report shall also be provided in the Application for Certification, except that confidential information (archaeological sites or areas of religious significance) shall be submitted under a request for confidentiality pursuant to Title 20, California Code of Regulations, § 2501 et seq. At a minimum, the technical report shall include the following:

Information required for the AFC to conform to the regulations:

a. ~~Include the research design for the project, including the theoretical basis of the proposed research, a summary of the previous research, testable hypotheses/research goals, and discussion of the test implications of the expected archaeological information, as specified in ARMR (p.27). Also discuss the results of the investigations as they relate to specific research design items and general objectives.~~

In response to our requests that the applicant provide a research design in the technical report for their new pedestrian archaeological survey and that they correlate the research design with their conclusions about the results of the survey, the applicant inadvertently misrepresents the roles of research designs in archaeological surveys in general and in the Energy Commission's siting process in particular. The applicant has also inadvertently misrepresented how the cited guidance envisions the use of research designs in the conduct of archaeological surveys.

The use of explicit research designs as an integral part of archaeological research, whether for surveys, test excavations, or full-scale excavations, has been a standard of the discipline since their use was begun in the late 1940s (Taylor 1948) and was firmly entrenched by the early 1960s (Binford 1962). Every undergraduate student of archaeology at every major research university in North America is taught this standard and is further admonished that to do an archaeological investigation without a research design is akin to looting. Staff is only able to assume that the

applicant's statement that "a research design is not a typical element of an archaeological survey report" is meant to refer to the subset of archaeological survey reports that are produced annually in the context of regulatory compliance. Among the reports of this subset and particularly among the subset of archaeological survey reports conducted to comply with CEQA, research designs are typically not included in archaeological survey reports because there is not regulatory enforcement of established disciplinary standards. Staff finds a fundamental legal and ethical flaw in the applicant's default argument that substandard archaeological research is sufficient. Staff and the regulations endeavor to hold our applicants and their consultants to the established standards of the overarching discipline.

In addition, the applicant appears to have inadvertently misread the cited guidance, *Archaeological Resource Management Report* (ARMR), with regard to the place of research designs in archaeological investigations. Beyond the general statement that the applicant cites in the preface to the guidance, ARMR goes on to state that:

Research designs are explicit statements of the theoretical and methodological approaches to be followed in an archaeological study. Research designs should be included in almost every type of archaeological report, and should vary in nature and level of detail with the undertaking and investigation type (p. 9).

This statement reflects the axiom above that underpins standard archaeological study, and makes it clear that the inclusion of a research design in the report for a large archaeological survey is a reasonable interpretation of ARMR with regard to the present project. The purpose of the research design is to link theory, known information, research goals and methods, as well as to develop predictive models for archaeological surveys and to state the goals of the research. The applicant's consultant performed an archaeological field survey, the methods and results of which are presented in both the Methods and Report of Findings sections of Appendix 5.3B. Presumably, the applicant's consultant prepared some type of research design appropriate to the undertaking and investigation type, that included research questions for the region and relevant to the study.

Not only is the information above essential to guide the **pre-application** archaeological field survey and the interpretation of any resources within the survey area, it provides the foundation on which to begin the evaluation of resources, whether for CEQA or NRHP purposes. Without a research design, there is no context to accurately interpret any finds or determine the potential eligibility of resources. This discussion is directly linked to the identification and evaluation of any potential historical resources and the development and discussion of any impacts or mitigation for those resources determined to be historical resources, and is not present in Appendix 5.3B.

The applicant and their consultant were made aware that staff expected to see a research design for the archaeological survey during the March 9 pre-filing meeting, when staff requested to review that research design prior to the consultant undertaking the survey. While the requested pre-survey review would have been a courtesy and was not required under the current regulations, staff's expectation for its inclusion in the technical report should not be unexpected and is required by the regulations.

The applicant's implication that the only appropriate place for an archaeological research design is in the cultural resources monitoring and mitigation plan (CRMMP) that is often a condition of certification is patently unfounded. Staff assumes, however, that the research design used to

guide the pre-application archaeological survey and the resulting data and interpretations would then be used to inform the data recovery research designs that are typically included in a CRMMP.

As previously requested, please provide the research design used to guide the pre-application archaeological survey, including the theoretical basis of the proposed research, a summary of the previous research, testable hypotheses/research goals, and discussion of the test implications of the expected archaeological information, as specified in ARMOR. Also, please discuss the results of the investigations as they relate to specific research design items and general objectives.

Binford, Lewis 1962 "Archaeology as Anthropology," American Antiquity 28(2):217-225.

Taylor, Walter W. 1948 A Study of Archaeology, Memoir Series of the American Anthropological Association, No. 69, Menasha.

Response—

The research design for the archival research and fieldwork phase of the cultural resource inventory for HHSEGS is provided below. Sections 5.3.3.6.1, 5.3.3.6.2, and 5.3.3.6.3 of the AFC and Appendix 5.3B **Methods**, contain detailed descriptions of the methods used to conduct the research. The response below focuses on describing research objectives, survey expectations, research questions, the types of resources anticipated to be found in the HHSEGS study area, and findings relative to research questions and objectives.

HHSEGS Research Design

Research Objective

This section provides the research design used by CH2M HILL to guide the records and archival search and subsequent fieldwork phase of the cultural resource inventory for HHSEGS. Given identified themes for this project, property types and survey expectations were defined. The methods used both during the records and archival search and the fieldwork phase were planned to meet or exceed the BLM requirements for a Class III survey outlined in *Cultural Resource Inventory General Guidelines* (BLM 1990) and the *State Protocol Agreement* between the BLM and the Nevada State Historic Preservation Office, as amended (BLM 2008), as well as California Archaeological Resource Management (ARMOR) reporting and California Environmental Quality Act (CEQA) requirements for analyzing potential impacts to historical resources.

The initial goal was to identify any cultural resources located within the project so that effects of the project could be assessed. To accomplish this goal, background information was examined and assessed, the study area was defined as well as the larger ethnographic study area, and a field survey was conducted to identify cultural remains. Reviews of the records search results, previous work in the project area and vicinity, and a historical map check indicated that cultural resources within the study area were likely to be mostly prehistoric sites dominated by lithic scatters with few to no diagnostic artifacts.

This research design is intended to provide a framework for testing a regionally applicable model of human prehistoric mobility and subsistence within the confines of the HHSEGS

study area and immediately surrounding region. Acquisition of baseline data such as archaeological site types, chronologies, and artifact typologies within the overarching framework of the research design are necessary to relate the archaeological resources within the study area to the prehistory of the region. This in turn provides a framework for evaluation of the resources. When evaluating resources within a given area, principal questions to be addressed include chronology of the resources, identify of the cultural tradition that a resource appears to reflect, and site/resource types, which must be identified and clearly described with respect to historic contexts.

The fundamental goals of an intensive pedestrian (BLM Class III) inventory are to identify and document previously unrecorded cultural resources and analyze cultural materials, not only to better characterize potential project effects, but also to attempt to confirm or elaborate on our current understanding of the prehistory and history of the region. From a management perspective, the ability of specific resources to address research questions provides a basis to evaluate California Register of Historic Resources (CRHR) and National Register of Historic Places (NRHP) eligibility. Methods for conducting the field survey and inventory are described below.

Summary of Field Methods

Following is a brief summary of the methods to be used to collect data in the field:

1. Since the HHSEGS is also considered a federal undertaking and Nevada BLM serves as the lead federal agency, all fieldwork will be conducted under the direction of archaeologists listed on CH2M HILL's Nevada BLM Cultural Resource Use Permit No. N83761, valid through September 17, 2013 (the California BLM Barstow Field Office deferred its Fieldwork Authorization approval process for the small area of California BLM land included in the pedestrian survey to the Nevada Southern Nevada District Office).
2. The survey will use 15-meter (50-foot) transects (following California common procedures, and as requested by the Southern Nevada District Office of BLM).
3. All archaeological resources identified or relocated will be plotted with a sub-meter-accurate Trimble GPS, plotted on a USGS 7.5' topographic map, and recorded on the California Department of Parks and Recreation forms. (For sites on Nevada BLM land, the Nevada BLM short form or the IMACS long form, as appropriate, will be used.)
4. Resources will be recorded as sites or isolates according to the State Protocol Agreement between the Bureau of Land Management, Nevada, and the Nevada State Historic Preservation Officer (as amended through January 2008).
5. All cultural resources identified during the survey of the project area will be evaluated for eligibility for listing in the CRHR and NRHP. If subsurface testing or detailed mapping is required for CRHR/NRHP evaluation, recommendations will be made for further work.
6. Historical period sites will be recorded, described, and mapped in terms of artifacts present, such as number and types of tin cans, bottles, wood, and metal debris and features and structures. Citations for diagnostic historic artifacts will be included in both the site report and site forms. Cairns and prospects without associated refuse will not be

recorded, as they could be modern. All isolates and sites will be documented using NAD 83 Datum, UTM coordinates. All isolates will be recorded with locational information and assembled in an isolate table that will include all isolates identified within the project area.

7. Diagnostic artifacts will be photographed and mapped to record provenience. Field illustrations will be created for all temporally diagnostic artifacts, such as projectile points. Field illustrations for other diagnostic artifacts will be prepared as the Field Director deems necessary. Artifacts are considered diagnostic if chronology or function can be determined; diagnostic artifacts may include projectile points, prehistoric tools with use wear, ceramics with maker's marks, and embossed glass. Non-diagnostic artifacts, such as bifaces, biface fragments, point tips and midsections, and expedient tools will not be given the same level of documentation if their specific characteristics cannot provide interpretive information. No artifacts will be collected.
8. The Nevada BLM Cultural Resource Inventory General Guidelines (4th edition), *Guidance for Recording Cultural and Paleontological Resource Locations for the BLM using Global Positioning System Technology*, and the NVCRIS GIS Data Requirements will be followed when documenting isolates or sites. Requirements are as follows:
 - a. GPS coordinates (NAD 83 Datum, UTM coordinates) for each isolated artifact/site.
 - b. A GPS-generated site map.
 - c. A narrative site description that fully characterizes each of the sites.
 - d. Site maps drafted to scale with all pertinent land features, prominent contours, site boundaries, north arrows, and a legend.
 - e. At least two overview site photographs, displaying different aspects of each site recorded. Features are to be photographed, including petroglyphs and pictographs, stone circles, foundations, and hearths.

Research Questions

The literature review and records search results suggest that the project area has a moderate to high archaeological sensitivity due to the proximity of resources which, while not present within the HHSEGS site itself, may account for some aspects of archaeological records within the project area. Pertinent research questions that are applicable to the project site are discussed below.

Prehistoric and Ethnographic Cultural Resources

In addition to the usual research topics having to do with chronology, settlement and subsistence, lithic technology we believe it is appropriate to emphasize one aspect of this area that will serve to explain many aspects of the archaeological record. It is a desert and has been so for at least the last 8,000 years. In a region such as the Mojave Desert where available water is the single most critical limiting factor to virtually all life, prehistoric sites tend to be located near springs or seasonal water sources, and in areas with shelter and higher ecosystem productivity, such as foothills and upland areas. Since plant resources are limited as well in this desert region, sites will also tend to be located in areas where seasonal plant resources may occur in particular abundance. By no coincidence, in some

circumstances these also happen to be where water is available. Reflections of the importance of and focus on water and plant resources, in a region that has little of either, can also be expected to extend into the ethnographic record.

The research topics and subsequent related research questions are presented below.

Chronology

The chronology of prehistoric occupation is a fundamental issue that drives our ability to address other questions pertinent to reconstructing regional culture history. Numerous culture chronologies have been hypothesized for the Mojave Desert over the years (see Section entitled *Prehistory of the Northern Mojave Desert* in Response B1) but many questions remain, particularly regarding *why* changes in prehistoric technology, resource use, and settlement systems occurred. Therefore, because a chronological framework of cultural change can be compared to environmental chronologies, as well as to cultural chronologies in other areas, chronology itself becomes an important parameter that, once established, guides and contributes to answering nearly all the research questions proposed. By inference then, lack of chronological resolution severely limits our ability to glean meaningful inferences from the archaeological data. We also hasten to acknowledge that correlation does not necessarily indicate causation, but it is among the first steps in establishing and then testing such hypothesis.

Research Questions

- What is the temporal context of prehistoric and protohistoric archaeological remains within the project area? Is this chronology consistent with the findings of past research locally and regionally?
- Are multiple time periods represented within the project area?
- Do the various time periods represented by sites within the project area appear to display discrete spatial patterns?
- Are any correlations with the regional chronology of environmental change evident?

Settlement and Subsistence

Perhaps the most important contribution of survey research is in the area of understanding settlement system issues. Knowing with some precision where sites are located across the landscape is a large step toward understanding how prehistoric people used the land.

The earliest accepted prehistoric sites in the Mojave Desert are found on relict shorelines and beach terraces of Pleistocene lakes. The archaeological assemblages from this time period, dated from 8,000 to 10,000 B.P., are known as the Lake Mojave Complex, a regional expression of the Western Pluvial Lakes Tradition that extends throughout the western Great Basin. Fluted points indicative of an earlier Paleo-Indian occupation are also found in these contexts, but to our knowledge Paleo-Indian sites are lacking in the Mojave Desert.

Several privately documented prehistoric campsites were informally reported at the Hidden Hills Ranch by the owner, Roland Wiley, in the 1970s. No formal documentation of these resources was allowed by the owner; however, UNLV staff were allowed onsite to observe

and photograph these sites, which were noted to contain lithics, archaic projectile points, crescents, as well as Kayenta and Paiute pottery (Knight and Leavitt, 2003).

This HHSEGS project area is situated at the border of the traditional lands of the Panamint, a Western Shoshone group, and the Southern Paiute. Modern Paiute report that the area was a traditional hunting ground for desert tortoise. Southern Paiute historically associated with the Pahrump Band also report that the area was a traditional hunting ground, and that during years of high spring discharge at least the area around Stump Spring, about 6 km to the east, was the site of farming “green corn and yellow melons,” as well as dances during the harvest season. Historically, the Hidden Hills Ranch has been used since the 1920s for cattle ranching (McCracken, 2009; BLM Land Patents).

Isolated roasting pits were found during surveys near the HHSEGS (Seldomridge, 1988). Lithic scatters, roasting pits, cleared circles, and rock rings are noted in lower parts of the Pahrump Valley. Rockshelters and rock art have been recorded in the mountainous areas around the valley (Knight et al., 1984; Myhrer, 1994). One prehistoric habitation site with midden, lithics, and ceramics is recorded at Mound Spring (Green and Brennan, 1980), about 6 miles north of the project area.

Two additional prehistoric habitation sites with midden, roasting pits, and burials are located on the old Manse Ranch. One of these sites, the Bowman site, is located adjacent to an extinct, artesian-fed stream bed and less than a mile from another spring mound, the Bolling Mound. Water expelled from the Manse Spring was known to create ponds in the modern era; this likely occurred in the past, as well (Smith, 2007). The Bowman site contains ceramics that appear to be Paiute brown ware, as well as obsidian. One burial at the Bowman Site contained a Puebloan Black Mesa black-on-white bowl. Projectile point types were found that dated from the Middle Holocene to the Late Holocene. The Bolling Mound habitation site is located approximately a mile from the Bowman Site, still on the Manse Ranch at the Bolling Mound Spring. Surface artifacts at this site indicated Southern Paiute occupation in the Late Holocene and the earliest deposits included a Pinto point (Smith, 2007). Excavations at the Bolling Mound and Bowman habitation sites north of the HHSEGS indicate that the occupation of the Pahrump Valley began at least as early as during the Pinto Period and continued into the Historic Period (Bunch, 2003; Smith, 2007).

Another prehistoric habitation site is recorded at Stump Spring. This site contains several roasting pits, lithics, ceramics, flaked tools, fire affected rock, and a single marine-shell bead. The ceramics are identified as Puebloan specific to the Virgin-Branch Anasazi (White and Myhrer, 1989). The remains of an adobe structure have been recorded here as well (but no longer extant), and the site is situated along the OST-MR corridor. Agave (*Agave utahensis*) and pinyon (*Pinus monophylla*) processing sites are recorded in Trout Canyon in the Spring Mountains, 15 miles northeast of the project area. Other sites found in Trout Canyon contain lithics, groundstone, and ceramics (Knight and Leavitt, 2004). The other mountains surrounding the Pahrump Valley are low, desert ranges without the woodland resources of the massive Spring Mountains to the east. It is therefore reasonable to expect that seasonal rounds directed at resource procurement would have been frequently directed to the Spring Mountains.

Research Questions

- Is there diagnostic evidence presented by the cultural material encountered which would indicate site use by a specific prehistoric population or time period?
- Does the distribution of sites and isolates suggest a settlement system on the foraging pattern *sensu* Binford (1980)?
- Can the site's function be discerned by the presence or absence of artifact types? For example, a reduction station would predominantly contain lithic remains from the primary reduction stage, while sites containing a large majority of groundstone or tertiary flakes could indicate specialized campsites.

Prehistoric Ceremony, Religion, and Places of Traditional Value

Modern Paiute report that the Pahrump Valley was a traditional hunting ground. Southern Paiute historically associated with the Pahrump Band also report that the area was a traditional hunting ground, and that during years of high spring discharge at least the area around Stump Spring, about 6 km to the east, was the site of farming "green corn and yellow melons," as well as dances during the harvest season. Furthermore, various landforms are mentioned as sacred in the traditional stories and songs of the Paiute yet they do not maintain physical manifestations archaeologists could identify during a survey. We will assist the BLM and CEC, as requested, to work with tribal representatives to help address questions of spirituality, as well as to make inquiries about known sacred sites to the Native American Heritage Commission. This will help to identify natural features within the project area that have spiritual significance to Native Americans.

A prehistoric rock art tradition found in southern California includes rock alignments. The majority of rock alignments are simple geometric forms, such as curved lines, loops, and straight lines (McCarthy 1989). A majority of rock alignments are simply lines that run across the desert pavement (Whitley 2001:67). Unfortunately, little ethnographic evidence exists for the making and significance of rock alignments, and many of the rock alignment sites are found with few or no associated artifacts, making their interpretation and dating very challenging. Often, rock cairns and small packed gravel circles are found near rock alignments (Davis and Winslow 1965). Ethnographic evidence for the creation of rock cairns during a shaman's vision quest has been noted (Whitley 2001:96) and, possibly, this could extend to the creation of rock alignments.

Research Questions

- Are there any features that appear problematic in terms of identifying function, and therefore might have spiritual significance?
- Is it possible to identify spiritually significant places, such as sacred landforms, that do not manifest as archaeological sites?

Lithic Technology and Procurement

Quarry sites may be extensive and involve the mining of lithic material, or the site may be an area where cobbles from outcrops were tested for suitability for lithic reduction (or flaking) qualities. Such areas are sometimes referred to as lithic prospects (Wilke and Schroth 1989). Available lithic materials on alluvial fans frequently were tested for quality,

and exploited when they were encountered by hunter-gatherer bands pursuing their seasonal round. Lithic prospecting is thought to be an “embedded strategy,” as the collection and testing of lithic materials does not appear to be the primary motivation for movement through the region (Wilke and Schroth 1989).

Most attention regarding prehistoric stone acquisition for toolmaking has focused on major quarry areas where large quantities of high-quality lithic materials were available. Available lithic material on alluvial fans frequently were tested for quality and opportunistically exploited when they were encountered by hunter-gatherer bands pursuing their seasonal round. Such prospecting was described as an “embedded” strategy that accompanied the primary activity that brought people to any given locale (Binford 1979; Gould and Saggars 1985). Further, Wilke and Schroth (1989) have characterized lithic raw-material prospects as a type of site in contrast to lithic quarries. Prospects are defined as places where potential lithic resources were assayed or tested for quality. They further distinguished cores as formed artifacts reduced from raw material that served as sources for detaching additional flakes, in contrast to tested raw material. Raw tested material refers to masses of naturally occurring stone from which at least one flake has been removed to assess the quality of the stone. The patterns of such prospecting might reflect the distribution of useable lithic materials as well as other activities.

Research Questions

- To what extent were sparsely occurring lithic materials found on the surfaces of alluvial fans exploited?
- Were sources of useable cryptocrystalline material and volcanic rock in the alluvium of the basin margin utilized or prospected?

Prehistoric Trade and Economic Exchange

Pinto Complex sites, believe to date from 7000 to 3000 cal B.C., are found in a wide range of environments, and the inferred flourishing of new economies, including greater plant-resource exploitation, is seen both in the desert and on the coast. *Olivella* shell beads have been found with Pinto sites, indicating the beginnings of coastal trade by Mojave Desert people. The start of the Gypsum Complex coincides with the end of the Middle Holocene period of maximum aridity that began at approximately 6,000 B.C. Despite the paucity of sites dating to this period, the first extensive evidence for contact between the desert and the coast dates to the Gypsum Period. Southwestern influence in the California deserts is also observed (Warren, 1984; Sutton et al., 2007). *Olivella* shell beads and *Haliotis* rings were apparently traded from the coast. New procurement strategies and regular trade contact with peoples living on the coast seem to have provided stability to desert dwellers of the Gypsum Complex. Despite periodic climatic excursions to a warmer, drier climate that may have lasted for centuries, populations did not decrease in the deserts at the end of the Gypsum Complex period as they had at the end of the Pinto Complex period (Sutton et al. 2007).

The Rose Spring Complex succeeded the Gypsum Complex from about A.D. 200 to 1100 and appears to display continuity with the Gypsum Complex. Similar artifacts, such as millings, manos, mortars, pestles, and incised stones were still used. The Rose Spring Complex display a strong coastal influence extending into the western Mojave Desert and

Antelope Valley (Warren 1984). During this period, the influence of the Basketmaker III and Pueblo cultures spreads into the eastern Mojave Desert. The project area is located at a crossroads of the influence of both the California coast to the west, and the Anasazi of the Colorado Plateau to the east (Warren and Crabtree 1986). Consequently, Rose Spring sites contain a variety of trade items, including southern California shell beads, steatite items, and other coastal artifacts. Rose Spring sites are found near springs, washes, and, occasionally, dry lake shores.

Within the southeastern Great Basin, including the northern Mojave Desert, the Late Prehistoric Period (A.D. 1100 to Historic Period), separate complexes emerged that appear to represent the advent of currently recognizable ethnographic groups. Anasazi turquoise mining and Hakatayan influence moved west from the Colorado River early during this period. Somewhat later the Numic-speaking peoples historically identified as the Paiute, Shoshone, and Ute spread east and north from southern California through the Mojave Desert (Madsen and Rhode 1994). Characteristic artifacts include Desert series and Cottonwood projectile points, brownware ceramics, shell and steatite beads, and milling tools. Trade continued to develop and expand with groups on the coast, as well as with groups to the east.

Research Questions

- Is there evidence of prehistoric trails or transportation networks within the project area? Is there archaeological evidence to determine the age of any such trails?
- Is there evidence that can link archaeological sites or ethnographic cultures to trails or rock features?
- What evidence is available to chronologically or ethnographically identify various rock features often found in this area of the Mojave Desert and to corroborate whether these features were associated in any way with trade?
- What artifacts are found on sites that may indicate long-distance trade (i.e., *Olivella* shell beads, *Haliotis* rings, southern California shell beads, steatite items including beads, turquoise items, ceramic ware)?

Historic Trade and Economic Exchange

The Project is in an area that was ranched and mined during the Historic era. The Goodsprings District was one of the more active mining districts in the West before World War I. Employment from nearby railroads would have attracted many people seeking work and, presumably, some of these workers would have been attracted to mining.

Research Questions

- Is there evidence at mining sites to indicate that various ethnic groups were involved in mining activities in this part of the Mojave Desert?
- Can any new mining sites be attributed to resource extraction that has not been previously documented?
- If a new mining site is found, how can it add to the body of data regarding existing mining sites (i.e., newly identified mining districts or types of resources extracted)?

Transportation and Utilities

Transportation is a major theme in the vicinity of the project area. The Old Spanish Trail/Mormon Road (OST/MR), used to connect Santa Fe and Los Angeles during the Mexican Period, was also an immigrant route during the American Period, and was favored by Mormon emigrants traveling from Salt Lake City to San Bernardino in the mid-1800s. The formally recognized portion of this route is located less than 1 mile south of the project area.

The modern Old Spanish Trail Highway is a paved road that leads from Nevada Route 160 to the Town of Tecopa, and takes its name from the OST/MR but is not recognized as an actual alignment of the OST/MR.

Although the name is singular, the OST/MR typically consists of a complex of subparallel routes or corridor created as different groups picked their way across the desert, some following in previously established tracks, some blazing “better” routes that were then followed by others afterwards. Evidence of specific immigrant parties might be found along these trail segments. No other known major historic transportation corridor is presently known to traverse the project area.

Research Questions

- Does evidence exist within the project area for older trails or tracks that may be segments of the OST/MR?
- Does evidence exist within the project area for camp sites associated with the OST/MR? If so, do artifacts associated with the transportation corridor reveal the age of the sites or the ethnic identity of the people who temporarily occupied them?
- How have major transportation corridors such as the OST/MR affected the historical use of the project area?

Prehistoric Resources

Data Needs

Sites needed to address the questions posed above pertaining to potential prehistoric use of the project area would include, but not be limited to, temporary late prehistoric and ethnohistoric campsites along the margins of ephemeral lakes and in areas of sand dunes and springs where potentially edible vegetation exists. Pleistocene shoreline features, if identified in the survey area at higher elevations, could exhibit archaeological material related to the Lake Mojave period, dating prior to 5000 B.C.

Other prehistoric archaeological site types with the potential to address the posed research questions include lithic scatters, raw-material testing (i.e., lithic prospects) and core-reduction loci, ceramic scatters, and possible trails. Trail segments may be preserved and visible on stable surfaces.

Travel-related feature types commonly found in association with human travel corridors include trail markers, rock cairns, shrines, and petroglyphs (Becker and Altschul 2008). Dropped cultural material or trailside artifacts may also be present along trails. Cleared or

rock-outlined circles are also common prehistoric features found on stable surfaces of alluvial fans and benches (Blair and Fuller-Murillo 1997).

Artifacts, such as a diagnostic lithic or ceramic artifacts, that can be associated with a specific cultural period would be useful in discerning the overarching regional pattern of settlement and occupation.

Prehistoric Site Types

Five types of prehistoric sites have the potential for being identified and documented in the HHSEGS project area.

Lithic, Ceramic, and Ground Stone Scatters or Concentrations

Lithics, ceramic, and ground stone scatters and concentrations are a type of prehistoric site that exhibits solely lithic debitage, ceramic sherds, and/or ground stone fragments. Features are not present at such site types. These sites were generally single-use sites, or there may have been repeated visits, but there is no detectable stratigraphic separation, which can somewhat limit research value. Where located on desert pavements, these sites lack subsurface deposition. Found in sand dune areas, surface deflation (wind-blown erosion) mixes co-occupations and forms a single horizon without temporal definition. One or more types of cultural material may be identified in such artifact scatters.

Cleared Circle Sites

Cleared circles are commonly found in the Mojave Desert and in the Colorado River region (Blair and Fuller-Murillo 1997; Rogers 1966). Cleared areas lack desert pavement, rock, and small stones, and they are roughly circular in outline; these types of features generally lack subsurface deposits and cultural debris.

Rock Ring Sites

Rock rings are also commonly found in the Mojave Desert as isolates or in clusters on stable surfaces and desert pavements. Some large rings have been identified as the remains of habitation structures, and smaller rings may indicate hearths. They are generally circular in shape, but ovoids and rectangles have also been noted (Rogers 1966). These rings have been intentionally shaped using rocks ranging in size from cobbles to small boulders, most often one course high. Buried subsurface material may be present with these features. Rocks associated with prehistoric rock ring features most often are buried in the ground surface or share a common chemical encrustation line where the former ground surface was prior to deflation. These are compared to modern rock rings that lie directly on the surface or have unweathered surfaces newly exposed.

Open Habitation Sites

Open habitation sites generally exhibit evidence of a variety of occupation debris, including an assortment of lithic debitage and tools, ceramics, and ground stone, and they often have fire-affected rock features along with accumulated ashy, midden soil. Unless heavily deflated, such site types have subsurface deposition. Habitation site use is associated with longer-term occupation than lithic scatters or repeated occupations of seasonal or single-use sites.

Trail Sites

Prehistoric trails are associated with the movement of people from one place to another point of predetermined destination. In areas where trails cross desert pavement, they are visible by a change in soil color or texture and, usually, large and medium rocks have been pushed to the side, forming a semblance of a border. Human-used trails will include associated cultural material, trail markers, rock cairns, shrines, or petroglyphs.

Historical-Period Site Types

Construction Camp Sites

Related to both contextual themes of transportation and power transmission, construction camps exhibit a wide range of feature and material remains. Construction camps were temporary encampments where construction workers were housed and fed. In the case of railroad construction camps (ca. 1903 to 1905), they exhibit many redundant features, including a blacksmith area, dugouts, tent pads, fire hearths, domed rock ovens, horse picket lines, saloon tents, cook tents, and associated refuse material (White 1997, 2001). Wagon roads and water pipelines often are associated with railroad construction camps. Camps associated with the construction of the power transmission lines are likely to have less variety in features and refuse debris reflecting a later time period. Both camp types will be in close spatial association with either the railroad grade or power transmission line.

Mining Sites

Mining-related sites also exhibit a wide range of features. Simple excavated holes in the mountainside may be evidence of prospecting, and adits (horizontal passages) and shafts (vertical passages) represent more substantial efforts at mineral exploitation. Tent or building pads are more likely found in association with shaft and adit features, reflecting a more permanent stay. Machinery or parts are present with the more substantial features. Mine camps, whether large or small, have the ubiquitous associated refuse scatter and concentrations. Mine sites can also be recognized by rock cairns without or without wooden posts. Waste rock dumps are associated with adit and shaft features.

Transportation Sites

Transportation sites are linear resources related either to early wagon roads or later automotive roads or railroads. Wagon roads are most often detected by the presence of two parallel tracks spaced generally no wider than 4 feet. Artifacts associated with these two-track imprints reflect an early age within the Historic Period (e.g., the Old Spanish Trail/Mormon Road). Automotive roads have wide, relatively flat surfaces. The surfaces of automotive roads can be in the form of graded dirt, graded and graveled, oiled gravel, and, later in time, asphalt pavement. Culverts and drainage ditches are often associated with later automobile roads. Associated material remains include random toss and intentional dumping events, usually immediately adjacent to the roads. Railroad-related resources, to name a few, are those manifestations found along the railroad grade, including drainage berms, culverts, tunnels, trestles, telegraph lines, sidings, and construction and maintenance camps.

Electrical Transmission Sites

Like transportation-related resources, electrical transmission sites are linear with a beginning point at the generation station and an end point where the electricity is delivered.

For purposes of this report, transmission sites include support tower structures and the lines they carry. Other resources that may be directly associated with transmission sites include construction camps and refuse.

Communication Sites

Communication-related sites, such as aboveground telegraph and telephone pole lines, are linear, with a point of beginning and a destination. Communication sites are most often found in parallel relationship with other linear transportation sites such as roads or railroads. Communication sites are detectable by the wooden poles or stumps cut off near ground level. Wire fragments and broken glass insulators are typically found in association. Date nails were occasionally driven into the poles to indicate the year of pole placement, although poles recycled from other locations may have been used. There may be associated refuse scatters related to construction or later maintenance activities.

Refuse Scatter/Concentration Sites

Historical-period refuse material was more often dumped on the landscape without conscience than buried. As such, refuse patterns can range from random drop, toss, and throw events to broad scatters resulting from secondary displacement to intentional concentrations at a particular location. Dumping of refuse can come in the form of single or multiple events over a given period or over extended periods of time. Some types of refuse material are important for their chronological information. Thus, refuse associated with a particular property type can provide temporal context. Refuse scatters and concentrations are most often associated with some other identifiable human activity and contextual theme.

Rock Features

Rock cairns, rock-outlined fire rings, rock alignments, and rock piles are typical rock features intentionally constructed during the historical period. Rock cairns may have functioned as mining claim markers, trail markers, or surveyed cadastral markers. Rock piles might be associated with unwanted rock being removed from one place and dumped at another. Rock alignments may be associated with aesthetic and functional developments around the camp to outline paths to the dining tent, outhouse, or to surround a native plant to give a site that homey feeling. Rocks associated with historical-period activity sit on the surface rather than being partially buried. Additionally, the unweathered surface of a rock is lighter in color and faces in a direction other than down. Cultural material may or may not be associated with these types of features. Unless associated with other material or features, rock features were recorded as isolates.

Survey Expectations

According to the archival research, several types of archaeological resources have the potential to be present within the HHSEGS study area.

Prehistoric archaeological sites that may be found in the project area include temporary camps, lithic scatters, lithic prospect sites, lithic reduction sites, ceramic scatters, and possibly trails. Petroglyphs and rock shelters could be found within the uplands. Other common features found on alluvial fans in creosote bush scrub environments are rock circles and alignments of various types.

Historic period sites that may be found include campsites and trash dumps in the vicinity of the railroads and historic roads known to be extant in the general area, including the Old Spanish Trail/Mormon Road, which runs approximately east-west less than a mile south of the project area. In addition, it is possible that segments of the OST/MR may cross the project area.

The project area includes several locales with favorable environmental conditions such as geology conducive to the procurement of lithic materials, areas near water sources, possibly areas with favorable vegetation (i.e., berries, herbs, nuts, and other edible and useful plants) and large amounts of game and animal trails, and areas with alluvial deposition. The archaeological sensitivity of the project study area is expected to be moderate to high.

Elements of the research design presented below include prehistoric- and historic-era research domains, and applicable research questions that provide a foundation for analyzing newly acquired data with the goal of assessing the potential of sites to address relevant research questions. The research questions were guided by information and archaeological data gathered from previous studies. Guided by this research design, data collection in the field can be viewed in the context of some preliminary models regarding the types of resources likely to occur within the study area, thereby providing a framework for data collection and preliminary interpretation of observations on the ground.

Research questions applicable to the project area are proposed below. Although several questions have been posed specifically relating to prehistoric- and historic-period resources, the overriding question is whether the proposed project area contains historic and prehistoric cultural resources that are potentially eligible for listing in the CRHR or NRHP, indicating that they have the potential to yield significant archaeological or historical information and, if so, whether they may be significantly affected by project implementation, thereby requiring mitigation.

Findings From Survey

Summary

CH2M HILL conducted archival research; contacted other interested agencies, Native American groups, and historical societies; and conducted a complete field investigation. These efforts yielded 14 archaeological sites that have the potential to be affected by the HHSEGS project (Table B2-1). No other significant prehistoric or historic archaeological remains, or any historically or architecturally significant buildings were identified to have potential for impact.

TABLE B2-1
Archaeological Sites Recorded and Evaluated within HHSEGS Study Area

Site Number	Site Type	CRHR Eligibility Recommendation
CA-INY-2492	Prehistoric Lithic Scatter	Not Eligible
S-1	Prehistoric Lithic Scatter	Not Eligible
S-2	Prehistoric Temporary Campsite	Potentially Eligible
S-3	Prehistoric Lithic Scatter	Not Eligible

TABLE B2-1
Archaeological Sites Recorded and Evaluated within HHSEGS Study Area

Site Number	Site Type	CRHR Eligibility Recommendation
S-4	Prehistoric Lithic Scatter	Not Eligible
S-5	Prehistoric Lithic Scatter	Not Eligible
S-6	Prehistoric Lithic Scatter	Not Eligible
S-8	Rock Cairn	Not Eligible
S-10	Prehistoric Lithic Procurement	Potentially Eligible
S-11	Prehistoric Lithic Scatter	Not Eligible
S-20	Historic Debris Scatter	Not Eligible
S-23	Prehistoric Lithic Scatter	Not Eligible
S-AF-1	Prehistoric Lithic Scatter	Not Eligible
S-AF-2	Prehistoric Lithic Scatter	Not Eligible

The survey also documented a total of 49 new isolates. These isolated finds are listed in detail in Appendix D within Appendix 5.3B of the AFC. Isolates, by definition, lack immediate cultural context and, therefore, lack the data potential that would be required to be considered eligible for the NRHP or CRHR. None of the isolated finds represents a unique archaeological resource and none is considered to be a historical property for the purpose of CEQA or NEPA/Section 106.

Research Questions Pertaining to Prehistoric Sites

The purpose of this section is to relate the findings of the investigation to the research questions posed above. As shown in Table B2-1, all but one of the 14 recorded sites are prehistoric. Therefore, only the research questions pertaining to prehistoric resources will be discussed below, with the exception of questions related to historical-period debris scatters.

Chronology

What is the temporal context of prehistoric and protohistoric archaeological remains within the project area? Is this chronology consistent with the findings of past research locally or regionally?

Are multiple time periods represented within the project area?

Do the various time periods represented by sites within the project area appear to display discrete spatial patterns?

None of the 13 prehistoric sites yielded temporally diagnostic artifacts, thereby making it impossible to establish a temporal context. Furthermore, many of these small prehistoric lithic sites appear to represent one to a few episodes of activity and the existence of subsurface deposits that might yield additional artifacts and features or display cultural stratification is unlikely. Therefore, these sites have little to no potential to yield information on age or chronology.

Settlement and Subsistence

Is there diagnostic evidence presented by the cultural material encountered which would indicate site use by a specific prehistoric population or time period?

No temporally diagnostic prehistoric artifacts were observed in the project area. Therefore, little to no interpretations can be made about use or occupation by any specific population or spanning any particular time period. Use of the HHSEGS appears to be fairly limited to opportunistic lithic procurement by mobile groups who traversed the area en route to various springs and other areas with resources. Aside from the small lithic procurement sites in the HHSEGS, only a rock cairn and a roasting pit were identified. Both of these features are known to have been employed by the Southern Paiute; rock cairns were known to be used as food caches and roasting pits were known to be used to process mescal or agave. Both of these activities also indicate the presence of mobile groups passing through on foraging rounds and seem plausible uses. Additionally, the presence of larger more complex habitation sites is known to be extant at nearby springs.

Does the distribution of sites and isolates suggest a settlement system on the foraging pattern?

The relatively high frequency of isolates in the project area (49 total) and small single-episode lithic prospect sites may represent a high frequency of activities within a day's walk of temporary camps, possibly situated to the north and east of the project site near the coppice dunes and sources of water.

Does the cultural material encountered reflect the type of activity pursued at the location by prehistoric populations?

The majority of the small lithic scatters found at the HHSEGS appear to represent lithic prospects. Only limited testing and possible removal of acceptable material appears to have occurred at these sites.

Prehistoric Ceremony, Religion, and Places of Traditional Value

Are there any other artifacts or features that might have spiritual significance?

The assemblage of archaeological resources observed, taken alone, does not appear to convey any dependable evidence of religious or ceremonial associations.

Is it possible to identify spiritually significant places, such as sacred landforms, that do not manifest as archaeological sites?

During the August 2, 2011 visit to the HHSEGS site, a Paiute elder noted that their traditional songs incorporated the various landforms of the Pahrump Valley and its surrounds, as well as their significance. The Southern Paiute traditional birthplace was noted by the elder as the Spring Mountains which, at altitudes exceeding 10,000 feet, stands over the entire valley, and figures prominently in songs that talk about the landscape and the tribal source of energy and history. Portions of a Deer Song are related by a Paiute ethnographer, Isabel Kelly in 1933, which describes how to hunt deer, the best places in the valley to hunt deer, and the names of the different places deer will travel, among other things. The song was traditionally sung by different singers and there were different versions. Proper singing among the Southern Paiute was clearly a very important way to transmit their history and legends. Other songs included the Talk Song and the Salt Song,

which described the travels of a wandering bird and the travels of two sisters, respectively (Fowler, 2002). These two songs, which are mourning songs, illustrate the extensive range of the Southern Paiute, well outside of their home range (Fowler, 2002) and into the ranges of other groups.

Lithic Technology and Procurement

To what extent were sparsely occurring lithic materials found on the surfaces of alluvial fans exploited?

The sites are generally situated on a sparse to rarely dense gravel lag that mantles most surfaces, rather than alluvial fans. This lag lacks the principal attributes of desert pavement (such as clasts interlocking, settled into the sediment and supporting well-developed desert varnish), consistent with the postulated late Holocene age of the alluvium. Many of the small lithic scatters found at the HHSEGS could be aptly described as lithic prospects. Only limited testing and possible removal of acceptable material appears to have occurred at these sites. The source material at these locations is limited to anomalous igneous clasts found within the HHSEGS and vicinity. The exception is site S-10, which is distributed around an ephemeral drainage that has chert cobbles in it. This site is characterized as a possible lithic procurement site or quarry and indicates that people were well aware of this source of good material for flaked artifacts. The material observed on Site S-4 was described as being of extremely poor quality for lithic technology, underscoring the relative scarcity of high-quality lithic material in this area.

Were sources of useable lithic material and volcanic rock in the alluvium of the basin margin utilized or prospected?

An apparent source of suitable chert in the form of cobbles in an ephemeral drainage was observed at Site S-10. The presence of multiple cores and many flakes indicates that this site was the locus of lithic material procurement. There is little, if any, evidence of intense occupation of the site, and it may have been used only for lithic procurement. The other 12 prehistoric sites in the project area, some of which may have been temporary camps, show evidence that lithic material was imported to these sites from other locations, suggesting that the material at Site S-10 may have been reduced to cores or flakes at the site to be easily transported elsewhere to be worked into tools and projectile points.

Prehistoric Trade and Economic Exchange

Is there evidence of prehistoric trails or transportation networks within the project area? Is there archaeological evidence to determine the age of a trail?

No trails were identified from archival research or field surveys, and no temporally diagnostic artifacts were observed in the project area. This said, we have been mapping potentially historic trail and road segments in Nevada using remote imagery (at the request of the Applicant and Nevada BLM) and this activity may lead to questions regarding whether similar features lie within the HHSEGS project area. Results will be provided as potential resources are identified with recommendations for further work as indicated.

Is there evidence that can link archaeological sites or ethnographic cultures to trails or rock features?

No trails were identified from archival research or field surveys, and no temporally diagnostic artifacts were observed in the project area. This said, we have been mapping

potentially historic trail and road segments in Nevada using remote imagery (at the request of the Applicant and Nevada BLM) and this activity may lead to questions regarding whether similar features lie within the HHSEGS project area. Results will be provided as potential resources are identified with recommendations for further work as indicated.

A single rock cairn and a roasting pit were identified in the project area (Site S-8). Both of these features are known to have been employed by the Southern Paiute; rock cairns were known to be used as food caches and roasting pits were known to be used to process mescal or agave.

What evidence is available to chronologically or ethnographically identify various rock features often found in this area of the Mojave Desert and to corroborate whether these features were associated in any way with trade?

The only rock feature was the small rock cairn that constitutes Site S-8. The cairn is not associated with any artifacts and is not dateable, nor is its precise function known. Rock cairns are known to have been employed by the Southern Paiute; rock cairns were known to be used as food caches

What artifacts are found on sites that may indicate long-distance trade (i.e., Olivella shell beads, Haliotis rings, southern California shell beads, steatite items including beads, turquoise items, ceramic ware)?

No artifacts were observed in the project area that were temporally or functionally diagnostic. None of the types of materials or artifacts noted in this area as trade items were found.

Additional General Discussion of Lithic Scatters

Lithic scatters are essentially uncomplicated sites, most typically confined exclusively to the surface. Lithic scatters possess a somewhat restricted range of artifact types, often consisting of chipping waste alone. The limited range of artifact types is presumed to represent a limited range of activities.

Over the years, various viewpoints have surfaced among archaeologists concerning the significance of lithic scatters in California (Jackson et al. 1988; Kowta 1976). In some regions of California, including areas of the northern Sierra Nevada, lithic scatters are the most prevalent type of site. Although archaeologists do not presently understand precisely what function or functions these sites represent, because lithic scatters often consist almost entirely of surface deposits of waste flakes, the fact that they are the most commonly encountered site type in certain localities indicates that they must represent some significant aspect of prehistoric lifeways.

Several archaeologists have attempted quantitative analyses of lithic scatters, with mixed results, in an attempt to interpret them in terms of prehistoric cultural behavior, and thereby come to appreciate the nature of their significance or lack of it (Caruso and Jensen 1978; Farber 1980; Jensen 1979b; Kowta 1975). As a result of some of these experiments, it has been determined that flakes comprising lithic scatters can be distributed extremely non-randomly (i.e., in some apparently systematic pattern as determined by statistical spatial analyses), although the reasons for such distributions are unknown (Farber 1980; Kowta 1975). Kowta (1976:21) proposed that, when sufficient comparative data become available, quantitative analyses of lithic scatters might eventually enable archaeologists to infer the nature and

range of activities that they represent; the numbers and demographic profile of the site occupants; and the duration, intensity, and intervals of use.

The California State Office of Historic Preservation (OHP), in cooperation with several other agencies, issued provisional guidelines for identifying and treating sparse lithic scatters. Essentially, sparse lithic scatters are sites that have no cultural remains other than chipped stone remains, have a mean or maximum surface flake density of 3 flakes/m² or less, and possess no subsurface cultural deposit. A booklet distributed by the California State Office of Historic Preservation provides criteria for identifying such sites (Jackson et al. 1988).

Under the provisional SHPO program, once sparse lithic scatters have been positively identified, and upon recording and collecting certain data, the sites can then be considered ineligible for the NRHP, and the Section 106 process need not proceed further. This program recognizes the fact that sparse lithic scatters might cumulatively provide important information, although individually they often represent a somewhat limited research potential (Jackson et al. 1988:10). By implementing this program in the 1980s, OHP had intended to provide a mechanism that is more streamlined than the Section 106 process for clearing such sites in the face of potential effects from proposed undertakings. However, the program also provides for the accumulation of data from these sites before they are disturbed.

It was in this context of recognizing that lithic scatters are generally not individually significant but may eventually yield significant archaeological information cumulatively that the lithic scatters were recorded during this investigation. Recording included observations about environmental setting; elevation; proximity to water, food, and lithic resources; density of the scatters, and other information that might eventually shed light on their function and the settlement and subsistence patterns of their occupants. The fact that these sites were recorded and the manner of recordation thus preserves the information thought to be applicable to future investigations of the cultural significance of these sites.

Research Questions Pertaining to Historic Site S-20

Questions were posed above regarding historical-period trade and economic exchange and transportation and utilities. These questions involved association with historic mining activities, ethnic identities, and historic transportation corridors such as the Old Spanish Trail/Mormon Road. This transportation corridor passes less than 1 mile south of the project area, and the potential was recognized that groups of people traversing this road may have camped nearby, possibly even within the project area.

Site S-20 was the only historical-period resource identified along the proposed transmission line corridor. It is described as a trash scatter consisting of one solder dot can, five sanitary cans, three soft top cans, and three bottle bases. These materials were attributed to the 1950s and 1960s and were deposited adjacent to a dirt road that was probably extant when the trash was deposited. However, it is not possible to determine the association of the site with any specific activity, industry (mining or ranching), or major transportation corridor. The site lies on desert pavement and shows no evidence of a stratified accumulation. Therefore, it is unlikely to yield any information relevant to the research questions posed for the historical period.

Works Cited

- Becker, Kenneth M., and Jeffrey H. Altschul. 2008. Pathfinding: The Archaeology of Trails and Trail Systems. In *Fragile Patterns: The Archaeology of the Western Papagueria*. Jeffrey H. Altschul and Adrienne G. Rankin, editors, pp. 419- 446. SRI Press, Tucson.
- Binford, Lewis R. 1979. Organization and Formation Processes: Looking at Curated Technologies. *Journal of Anthropological Research*. 35:255-273
- Binford, Lewis R. 1980. Willow smoke and dog's tails: hunter-gatherer settlement systems and archaeological site formation. *American Antiquity* 45(1):4 -
- Blair, Lynda M., and Megan Fuller-Murillo. 1997. Rock Circles of Southern Nevada and Adjacent Portions of the Mojave Desert. Ms. on file, San Bernardino Archaeological Information Center, Redlands, California.
- Bunch, James H. 2003. A Class III Cultural Resource Survey of Three Material Pit Sources: Searchlight and Pahrump, Clark County, Nevada. Ms. on file, Harry Reid Center, Las Vegas, Nevada.
- Bureau of Land Management (BLM). 2008. State Protocol Agreement (as amended through January 2008) Between the Bureau of Land Management and the Nevada State Historic Preservation Office. Bureau of Land Management, Nevada State Office, Reno.
- Bureau of Land Management (BLM). 1990. Cultural Resource Inventory General Guidelines. Bureau of Land Management, Nevada State Office, Reno.
- Caruso, A. Glenn, and Peter M. Jensen. 1978. Archaeological Evaluation of Fourteen Prehistoric Sites in the Proposed Plumas-Eureka Land Exchange. Report in file, Plumas National Forest, Quincy.
- Davis, Emma Lou, and Sylvia Winslow. 1965. Giant Ground Figures of the Prehistoric Deserts. *Proceedings of the American Philosophical Society*. Vol. 109, No. 1
- Euler, Robert C. 1966. *Southern Paiute Ethnohistory*. University of Utah Anthropological Papers 78.
- Farber, Alfred. 1980. Picking up the Pieces: a Surface Collection at Site CA-Plu-250, Plumas County, California. Report on file, California Department of Transportation, Redding.
- Fowler, Catherine S. 2002. What's In A Name? Some Southern Paiute Names for Mojave Desert Springs as Keys to Environmental Perception. Conference Proceedings. Spring-fed Wetlands: Important Scientific and Cultural Resources of the Intermountain Region, 2002. <http://www.wetlands.dri.edu>
- Gould, R. A., and S. Saggers. 1985. Lithic Procurement in Central Australia: A Closer Look at Binford's Idea of Embeddedness in Archaeology. *American Antiquity* 50:117- 136.
- Green, Eileen M. and Lynda M. Brennan. 1980. A Cultural Resource Investigation of the Southern Section of Seismic Line #17 in the Pahrump Valley, Nye County, Nevada and Inyo County, California. Ms. on file, Harry Reid Center, Las Vegas, Nevada

Jackson, R., M. Boynton, W. Olsen, and R. Weaver. 1988. California Archaeological Resource Identification and Data Acquisition Program: Sparse Lithic Scatters. State of California Office of Historic Preservation, Sacramento.

Jensen, Peter M. 1979. Archaeological Investigations in the Proposed Chalk Bluff Ridge Land Exchange, Field Season 1978-1979. Report on file, Tahoe National Forest, Nevada City.

Knight, Kenneth C., Patricia DeBunch, Steven R. James, Robert M. Leavitt, Valerie Rodman. 1984. Nevada Department of Transportation Cultural Resources Report, Ms. on file Harry Reid Center, Las Vegas, Nevada.

Knight and Leavitt Associates, Inc. 2003. A Class III Cultural Resources Inventory of an Access Road from SR-160 in Pahrump Valley, Clark County, Nevada. Ms. on file, Harry Reid Center, Las Vegas, Nevada.

Knight and Leavitt Associates, Inc. 2004. A Class III Cultural Resource Inventory of an Access Road to a Private Parcel from SR-160 in Pahrump Valley Clark County, Nevada. Ms. on file, Harry Reid Center, Las Vegas, Nevada.

Kowta, Makoto. 1976. Lithic Scatters: A Neglected Resource. Paper presented at the Annual Meeting of the Society for California Archaeology, San Diego.

Kowta, Makoto. 1975. Quantitative Inferences from the "Lithic Scatter" at CA-Plu-121, Chester, California. Ms. on file, California Archaeological Inventory, Northeast Information Center, California State University, Chico.

Madsen, David B., and D. Rhode (eds.). 1994. *Across the West: Human Population Movement and the Expansion of the Numa*. University of Utah Press, Salt Lake City.

McCarthy, Daniel F. 1989. Rock Art Studies at Lake Perris State Recreation Area, Riverside County, California. Ms. on file, Eastern Information Center. Riverside, California.

McCracken, Bob. 2003. Pahrump's Link to the Past. Pahrump Valley Times, November 28, 2003.

Rogers, Malcolm J. 1966. *Ancient Hunters of the Far West*. Union-Tribune Publishing Company, San Diego, California.

Seldomridge, Jeffry S. 1988. Nevada Department of Transportation Cultural Resources Report, NDOT-CL043-88P. Ms. on file, Harry Reid Center, Las Vegas, Nevada.

Smith, Annette Joye (A.J.). 2007. *Organization of Lithic Technology at the Bowman Site (26NY809), Pahrump Valley, Nye County, Nevada*. Master's Thesis, Graduate College, University of Nevada, Las Vegas.

Sutton, Mark Q., Mark E. Basgall, Jill K. Gardner, and Mark W. Allen. 2007. Advances in Understanding Mojave Desert Prehistory, In *California Prehistory, Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp. 229-246. AltaMira Press, Lanham.

Tapper, N. J. 1991. Evidence of Mesoscale Thermal Circulation Over Dry Salt Lakes. *Palaeogeography, Palaeoclimatology, Palaeoecology* 84:259- 269.

Warren, Claude N. 1984. The Desert Region. In M.J. Moratto, California Archaeology, pp. 339-430. Academic Press, Inc, San Diego.

Warren, Claude N., and Robert H. Crabtree. 1986. Prehistory of the Southwestern Area in *Handbook of North American Indians, Great Basin, Volume 11*. William C. Sturtevant, General Editor. Smithsonian Institution, Washington D.C.

Wilke, Philip J., and Adella B. Schroth. 1989. Lithic Raw Material Prospects in the Mojave Desert, California. *Journal of California and Great Basin Anthropology*. 11(2): 146-174

White, William G. 1997. Site 26CK4842: *The Archaeology of an SP, LA & SL Railroad Construction Camp in Southern Nevada*. HRC Report 5-164-5. Harry Reid Center for Environmental Studies, University of Nevada, Las Vegas.

White, William G. 2001. Archaeological Excavation for the Apex Land Exchange, Clark County, Nevada. Volume II. Historic Sites 26CK1378, 26CK1380, 26CK5630, 26CK5678, 26CK5679, 26CK5687, 26CK5691, and 26CK5692. HRC Report 5-164-13. Harry Reid Center for Environmental Studies, University of Nevada, Las Vegas.

Whitley, David S. 2001. *The Art of the Shaman: Rock Art in California*. The University of Utah Press. Salt Lake City.

b. See items above (Appendix B(g)(2)(A); Appendix B(g)(2)(C) Information included in the technical report, except confidential information, shall also be provided in the Application for Certification. As the information in the AFC is identical to that presented in the Technical Report and is inadequate, as noted above, the Technical Report is also inadequate in these sections. Please submit a revised Technical Report that corrects the noted deficiencies.

Response- Based on clarification with the staff, a revised Technical Report is not necessary. However, we have added references to where the enclosed materials amend the sections in the technical report, so that staff will know where the responses fit into the report.

B3. Mitigation for Known Cultural Resources [Appendix B(g)(2)(E)(i)]

A discussion of measures proposed to mitigate project impacts to known cultural resources;

Information required for the AFC to conform to the regulations:

The regulation requires a discussion of measures proposed to mitigate project impacts to known cultural resources. To adequately identify impacts and appropriate mitigation, cultural resources and the significance of those resources must first be identified. Resources that are not historical resources for the purposes of CEQA (Guidelines 15064.5) are not subject to mitigation. If the resources have not been evaluated to determine whether they are a resource for the purposes of CEQA, which would require that the resources be evaluated for CRHR eligibility (including a discussion of the applicable criteria and integrity) or other CEQA significance criteria, impacts and mitigation cannot adequately be identified or discussed. Additionally, the DPR forms that were provided in Appendix 5.3B only provide recommendations for the National Register, which has a higher threshold of significance than the California Register or local registers. If the consultant is prepared to make a recommendation regarding eligibility, as they have in both the

DPR forms and in the Report of Findings in Appendix 5.3B, it is reasonable to assume that this exercise has been completed and is not a burden to include in the document.

As previously requested, please include complete evaluations for each resource, including whether a resource is eligible for the California Register of Historical Resources (CRHR) or eligible for listing or listed in a local register, or would otherwise be considered a historical resource for the purposes of CEQA, as stated in Section 15064.5 of the CEQA Guidelines. Include a discussion of how it does/does not meet each criteria and a discussion of the integrity of the resource. Also include the photographs noted in the included photograph logs.

Response- As requested, additional description to support resource evaluations for the purposes of CEQA is provided below. A refinement of the environmental setting and depositional environment has also been provided and has been taken into account in preparation of the evaluations. In addition, revised DPR forms that incorporate the refined environmental setting description for each site, revised eligibility statements, and photographs have been added to each DPR form which will all be submitted under a separate request for confidentiality.

Determination of Eligibility and Assessment of Potential Effects

Standards of Significance

Standards of significance for the proposed project were determined from adopted standards from the California Environmental Quality Act (CEQA) Guidelines Appendix G (2002).

CEQA Guidelines

According to the CEQA Guidelines Appendix G (2002), impacts to cultural resources would be considered significant if the project would:

- Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5
- Cause a substantial adverse change in the significance of an archeological resource pursuant to Section 15064.5
- Disturb any human remains, including those interred outside of formal cemeteries

A historical resource is a resource listed in, or determined to be eligible for listing in, the CRHR. Historical resources as defined in subdivision (j) of Section 5020.1 of the Public Resource Code, and included as such in a local register, or deemed significant pursuant to criteria set forth in subdivision (g) of Section 5024.1, are presumed to be historically or culturally significant for purposes of this section, unless the preponderance of the evidence demonstrates that the resource is not historically or culturally significant. The fact that a resource is not listed in, or determined to be eligible for listing in, the CRHR, not included in a local register, or not deemed significant pursuant to criteria set forth in subdivision (g) of Section 5024.1, shall not preclude a lead agency from determining whether the resource may be a historical resource.

Applicable Standards

Pursuant to Section 15064.5 (Determining the Significance of Impacts to Archaeological and Historical Resources of the State California Environmental Quality Act), a resource shall be considered to be historically significant if it meets the criteria for listing on the CRHR (PRC Section 5024.1, Title 14 CCR, Section 4852), including the following:

- It is associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California of the United States (Criterion 1)
- It is associated with the lives of persons important to local, California, or national history (Criterion 2)
- It 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 (Criterion 3)
- Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation (Criterion 4)

In addition to the above criteria, a resource must retain integrity to be considered historically significant. Integrity is the authenticity of the physical identity that is evidenced by the survival of characteristics that existed during the resource's period of significance. Evaluation of a site's integrity is subject to the site first meeting one or more of the four criteria for listing on the CHRH. Historical resources must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Rehabilitation or restoration does not necessarily discount a resource from eligibility. Integrity must also be evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. A resource that has lost its historic character or appearance may still have sufficient integrity for the CRHR, if it maintains the potential to yield significant scientific or historical information or specific data.

Public Resources Code Section 15064.5(b) states that a "project with an effect 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." Subsection (1) of that same section further defines a

"substantial adverse change" as "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired." Subsection (2) provides further definition of when a historical resource is "materially impaired."

Section 7052 of the Health and Safety Code establishes a felony penalty for mutilating, disinterring, or otherwise disturbing human remains, except by relatives. Penal Code Section 622.5 provides misdemeanor penalties for injuring or destroying objects of historical or archaeological interest location on public or private lands, but specifically excludes the landowner. PRC Section 5097.5 defines as a misdemeanor the unauthorized disturbance or removal of archaeological, historical, or paleontological resources located on public lands.

California Register of Historical Resources

As provided in California PRC Section 5020.4, the California Legislature established the CRHR in 1992. The CRHR is used as a guide by state and local agencies, private groups, and citizens to identify the state historical resources and to include which properties are to be protected, to the extent prudent and feasible, from substantial adverse change. The CRHR, as instituted by the California PRC, automatically includes all California properties already listed in the NRHP. It also includes those formally determined to be eligible for listing in the NRHP (Categories 1 and 2 in the State Inventory of Historical Resources), as well as specific listings of the State Historical Landmarks and in the State Inventory of Historical Resources), as well as specific listings of State Historical Landmarks and State Points of Historical Interest. The CRHR may also include various other types of historical resources that meet the criteria for eligibility, including the following:

- Individual historic resources
- Resources that contribute to a historic district
- Resources identified as significant in historic resource surveys
- Resources with a significance rating of Category 3 through Category 5 in the State Inventory (Categories 3 and 4 refer to potential eligibility for the NRHP; Category 5 indicates a property with local significance)

The CRHR follows the lead of the NRHP in utilizing the 50-year threshold. A resource is usually considered for its historical significance after it reaches the age of 50 years. This threshold is not absolute, but was selected as a reasonable span of time after which a professional evaluation of historical value/importance can be made.

Table B3-1 summarizes the sites documented and the CRHR eligibility recommendations. The survey documented a total of 49 new isolates. These isolated finds are listed in detail in Appendix D within Appendix 5.3B of the AFC. Isolates, by definition, lack immediate cultural context and therefore lack the data potential that would be required to be considered eligible for the NRHP or CRHR. None of the isolated finds represent unique archaeological resources and none are considered historical properties for the purpose of CEQA or Section 106.

TABLE B3-1
Archaeological Sites Evaluated for the CRHR

Site Number	Site Type	CRHR Eligibility Recommendation
CA-INY-2492	Prehistoric Lithic Scatter	Not Eligible
S-1	Prehistoric Lithic Scatter	Not Eligible
S-2	Prehistoric Temporary Campsite	Potentially Eligible
S-3	Prehistoric Lithic Scatter	Not Eligible
S-4	Prehistoric Lithic Scatter	Not Eligible
S-5	Prehistoric Lithic Scatter	Not Eligible

TABLE B3-1
Archaeological Sites Evaluated for the CRHR

Site Number	Site Type	CRHR Eligibility Recommendation
S-6	Prehistoric Lithic Scatter	Not Eligible
S-8	Rock Cairn	Not Eligible
S-10	Prehistoric Lithic Procurement	Potentially Eligible
S-11	Prehistoric Lithic Scatter	Not Eligible
S-20	Historic Debris Scatter	Not Eligible
S-23	Prehistoric Lithic Scatter	Not Eligible
S-AF-1	Prehistoric Lithic Scatter	Not Eligible
S-AF-2	Prehistoric Lithic Scatter	Not Eligible

Environmental Setting and Depositional Environment

The northern Mojave Desert is an arid region with little rain and extreme temperatures. Rainfall is less than 10 cm (4 inches) in many valleys, and reliable water sources are few and widely scattered. The arid climate is also responsible for very low ecological carrying capacity, meaning that food resources are sparse in most habitats, in terms of both plant as well as animal resources. As a consequence of the region's low carrying capacity, the ethnographic record as well as the archaeological record indicate that human populations were low, and focused on the relatively narrowly distributed areas where resources were common to abundant, at least seasonally, in this desert region.

The project area lies in the axial basin of the Pahrump Valley. This linear basin, oriented northwest-southeast, is typical of elongate valleys that lack a hydrologic outlet and therefore fill with fine-grained sediment over tens to hundreds of thousands of years. Coarse alluvium (cobble-sized and larger clasts) consists primarily of limestone with rare chert cobbles. Basalt and other volcanic rock in the alluvium exposed along the eastern margin of the basin in the project area suggest a through-flowing drainage once existed here, instead of a closed basin. It likely flowed north, and connected with the Amargosa River. No volcanic rock suites exist in the Spring Mountains to the east, and therefore these clasts may have been fluvially transported to the project area from the volcanics that lie to the east of Sandy Valley, about 20 miles to the southeast. However, tectonic movement likely blocked this drainage to the north by the middle Pleistocene (by 500,000 years ago) and since that time the area has been a closed basin.

The HHSEGS project area has the general shape of a right triangle with the legs of the triangle running north-south and east-west, and the hypotenuse lying parallel to the California-Nevada border. The Stateline Fault System (SFS; Scheirer et al., 2010) runs approximately parallel to the border, on the Nevada side. Visible scarps associated with the SFS comprise three successively higher-elevation, subparallel lineaments, about 0.25 mile, 1.6, and 1.8 miles northeast of the border. To the east of the SFS scarps lies the west bajada, or alluvial fan complex, of the Spring Mountains, and to the west is the project

area in the axial basin of the Pahrump Valley. This basin marks the position of the graben, or down-warped segment of crust, that lies to the west of the SFS (Lundstrom et al., 2002; Scheirer et al., 2010). The scarps just over the state line in Nevada are the surface expressions of low-angle normal faults, and these faults channel artesian water to the surface where springs still discharged historically at a few localities (e.g., Stump Spring, Mound Spring; Lundstrom et al., 2002; Quade et al., 1995). These limited areas are heavily vegetated, and watering spots for game. And, while these areas do not extend into the Pahrump Basin and the HHSEGS project area, mesquite (*Prosopis glandulosa*, *P. pubescens*) covered coppice dunes associated with the SFS are found less than one-quarter mile to the northeast.

Late Quaternary Environmental Changes

In a moisture-limited environment such as the Mojave Desert climate change looms large in explanatory hypotheses based on the archaeological record (e.g. Jones et al., 2004). Relatively modest changes in precipitation can result in relative large changes in ecosystem productivity as well as water-source reliability and frequency (*ibid.*). Given the massive Spring Mountains immediately to the east and the large orographic effect it has on precipitation and run-off (see Miffilin and Wheat, 1979), a pluvial lake likely occurred in the Pahrump Valley during the terminal Pleistocene and early Holocene, although strandlines appear to have been largely obliterated since that time.

During “pluvial” periods, enhanced recharge to the aquifer resulted in a higher water table and increased groundwater discharge along basin-margin faults like the scarps associated with the SFS (Quade et al., 1995). The desiccation of pluvial lakes and the concurrent water table decline caused by postglacial desertification led to the failure of most of these spring systems by approximately 8,000 years ago. As their mantle of vegetation died off, the spring discharge areas were left as badlands of white to buff-colored, carbonate-rich silts. These paleospring sediments, dominated by buff to white, carbonate-rich silt outcrops, were first studied in detail at Tule Springs in the Las Vegas Valley in the mid-Twentieth Century (Wormington and Ellis, 1967; Haynes 1967). Quade and others (1995) subsequently demonstrated that these deposits are of the same age from valley to valley in the northern Mojave Desert as consequence of the regional synchronism of climate change.

The oldest paleospring deposits usually considered to be of potential significance are those of the Unit E discharge episode, and date from about 12,000 to 8,000 B.P. (radiocarbon years before present) and encompass the Paleo-Indian and earliest Archaic periods. Widespread mobilization of alluvial fans and sand dunes followed during the middle Holocene period of maximum aridity (e.g., Spaulding, 1991), and the sediments associated with this period were designated Unit F in the Tule Spring sequence (Haynes et al., 1967). Older Archaic sites at the base of sand dunes in the upper Las Vegas Valley as well as Amargosa Desert date to the end of this period of aridity, or between 5,200 to about 4,000 B.P. (e.g., Mehringer and Warren, 1976). Subsequently, a relatively thick mantle of eolian sand and silt was deposited in arroyos in the Las Vegas Valley during the Late Holocene, and designated Unit G by Haynes (1967).

Geomorphic Setting of the Project Area

Data from geotechnical and paleontological investigations of the project area indicate that there are two principal Late Quaternary sedimentary units in the project area. A blanket of young (late Holocene or less than 4,000 B.P.), alluvial silty sand mantles older basin fill. This basin fill is indurated, carbonate-rich, and buff to white light-colored silty clay to clayey sand. This older basin fill appears to be highly weathered, and is likely at least Late Pleistocene in age. The younger overburden of sandy alluvium appears equivalent to the late Holocene Unit G of Haynes (1967). Geotechnical test pits excavated from nearer the state line and the alluvial fans extending through the SFS reveal primarily sandy strata that appear fluvial / alluvial in origin. Reworked eolian sand appears to be the primary component of this alluvium, with small-gravel lenses common. Because drainage is from the northeast, it is thicker near the state line than it is downgradient to the southwest and west. Conversely, test pits away from the toes of these fans are dominated by clay, or possess significant clay strata. The source of the relatively well-sorted quartz sand dominating this alluvial unit appears to be erosion of the coppice sand dunes immediately to the east. Areas mantled by the sandy alluvium of Unit G generally support creosote bush (*Larrea tridentata*) scrub. Where exposed, primarily on the west side of the project area, the older, fine-grained basin fill supports vegetation dominated by saltbush species (*Atriplex* spp.).

The stratigraphy of the geotechnical test pits appears consistent with a model of recent (post-Pleistocene and likely late Holocene), sandy alluvium encroaching from the east (Unit G) and covering an older surface, which appears to be of Pleistocene age. Where exposed on the west side of the project area, this older basin fill commonly supports a moderate to dense lag of carbonate nodules and carbonate pseudomorphs after insect burrows and plant roots, suggesting long-term deflation erosion and exposure of this basin-fill surface. No carbonate ledges or other carbonate deposits that could clearly be assigned to groundwater tufa were encountered. In many cases, carbonate nodules and carbonate pseudomorphs could be attributed to calcite nucleation in saturated soils near the capillary fringe. Where late Holocene sandy alluvium mantles this basin fill, principally on the east side of the project area, no autochthonous carbonate nodules can be found on the surface. Instead, a sparse to rarely dense gravel lag mantles most surfaces, indicating some deflation since deposition. This lag lacks the principal attributes of desert pavement (such as clasts interlocking, settled into the sediment and supporting well-developed desert varnish), consistent with the postulated late Holocene age of the alluvium. Studies in the central Mojave Desert suggest that desert pavement is poorly developed on surfaces less than about 5,000 years old (e.g., Wells et al., 1987, 1989).

CRHR Eligibility Recommendations

CA-INY-2492

Generally, small sites such as this lithic scatter represent one to a few episodes of activity and cannot be associated with any event or individual of local, regional, or national significance to be considered eligible for the CRHR under Criteria 1 and 2 or the NRHP under Criteria A and B, nor do they contain any remains of architecture or even art (rock art) that would make the site eligible for consideration under Criterion 2 of the CRHR or

Criterion C of the NRHP. However, these small activity sites are often isolated and present a body of data which is not necessarily colored by the complexities of a larger site (Glassow, 1985). Additionally, small sites, under the right circumstances, may represent a range of activities often not found at larger more complex sites, including resource procurement or processing, and thus, smaller sites, such as this lithic scatter, can often present information important to the prehistory of the region (CRHR Criterion 4 and NRHP Criterion D).

Site CA-INY-2492 is in good condition. However, the site appears to consist exclusively of lithic material as a component of the gravel lag on the surface of a sandy alluvial unit of relatively recent, late Holocene age. The deflation that led to the exposure of this gravel lag was likely responsible for the obliteration of all site context, and it appears unlikely that the site has a subsurface component. The small number of flakes and single core consistently point to the site's function as one of toolstone procurement and lithic core reduction, likely representing one episode of use, and this interpretation limits this site's ability to answer important questions regarding the local or regional prehistory. Because the toolstone is coming from local, naturally occurring sources the site cannot answer any questions regarding settlement patterns or trade. There are no diagnostic artifacts or remaining organic materials that could be used to date the site and help to define the temporal use of the site. Also lacking are any tools or other types of artifacts that could answer questions of technology or ethnicity. Thus, its potential for contributing to the prehistory or history of the area has been exhausted by this recording. CA-INY-2492 does not appear to be eligible for listing on the CRHR under any of the Criteria, nor the NRHP under any of the Criteria. Site CA-INY-2492 does not qualify as a historical resource for the purpose of CEQA or as a historic property under Section 106. No further work is recommended.

S-1

Generally, small sites such as this lithic scatter represent one to a few episodes of activity and cannot be associated with any event or individual of local, regional, or national significance to be considered eligible for the CRHR under Criteria 1 and 2 or the NRHP under Criteria A and B, nor do they contain any remains of architecture or even art (rock art) that would make the site eligible for consideration under Criterion 2 of the CRHR or Criterion C of the NRHP. However, these small activity sites are often isolated and, under the right circumstances, may present a body of data which is not necessarily colored by the complexities of a larger site (Glassow, 1985). Additionally, small sites may represent a range of activities often not found at larger more complex sites, including resource procurement or processing, and thus, smaller sites, such as this lithic scatter, can often present information important to the prehistory of the region (NRHP Criterion D and CRHR Criterion 4). However, the surface scatter of both in-situ and disturbed artifacts is sparse and does not lend itself to a definition of any significant type of activity site and likely represents a very limited episode of lithic reduction.

The limited number of artifacts consistently point to the site's function as one of toolstone procurement and lithic core reduction, likely representing one episode of use, and limits this site's ability to answer important questions regarding the local or regional prehistory. Because the toolstone is coming from local, naturally occurring

sources the site cannot answer any questions regarding settlement patterns or trade. Also lacking are any formal tools or other types of artifacts that could answer questions of technology or ethnicity. There were no temporally diagnostic artifacts recorded at this site to place use of the site within any chronology. Furthermore, Site S-1 generally lacks integrity due to the modern disturbances noted on the site disturbing the horizontal and vertical contexts of the site. A trowel test yielded sterile sediments, as did the spoil piles from the previous excavations. Because of the disturbances and likely sterile sediments contained under the site, its potential for contributing to the prehistory or history of the area has been exhausted by this recording. Site S-1 does not appear to be eligible for listing on the CRHR under any of the Criteria, nor the NRHP under any of the Criteria. Site S-1 does not qualify as a historical resource for the purpose of CEQA or as a historic property under Section 106. No further work is recommended.

S-2

Generally, small sites such as this temporary camp or resource processing site may represent one to a few episodes of activity and cannot be associated with any event or individual of local, regional, or national significance to be considered eligible for listing on the CRHR under Criteria 1 and 2 or the NRHP under Criteria A and B, nor do they contain any remains of architecture or even art (rock art) that would make the site eligible for consideration under Criterion 2 of the CRHR or Criterion C of the NRHP. However, these small activity sites are often isolated and, under the right circumstances, may present a body of data which is not necessarily colored by the complexities of a larger site (Glassow, 1985). Additionally, small sites may represent a range of activities often not found at larger more complex sites, including resource procurement or processing, and thus, smaller sites, such as Site No. S-2, can often present information important to the prehistory of the region (CRHR Criterion 4 or NRHP Criterion D).

Site S-2 is in good condition and it is located on relatively deep sandy alluvium of probably late Holocene age. Therefore, the possibility that the site has a subsurface component cannot be ruled out on these grounds. The presence of a possible mesquite roasting pit and the unknown potential for subsurface materials indicates this site may have potential for contributing to the prehistory or history of the area. Further testing and research would need to be conducted to more definitively make a determination of eligibility of this site. Site S-2 may be considered eligible for listing on the CRHR under Criterion 4 or the NRHP under Criterion D based on the potential for intact, buried cultural materials or data relating to resource procurement and processing. The site should be treated as eligible until such a time that further research can determine the potential for additional data relating to this type of resource.

S-3

Generally, small sites such as this lithic scatter represent one to a few episodes of activity and cannot be associated with any event or individual of local, regional, or national significance to be considered eligible for the CRHR under Criteria 1 and 2 or the NRHP under Criteria A and B, nor do they contain any remains of architecture or even art (rock art) that would make the site eligible for consideration under Criterion 2 of the CRHR or Criterion C of the NRHP. However, these small activity sites are often isolated and, under the right circumstance, may present a body of data which is not necessarily

colored by the complexities of a larger site (Glassow, 1985). Additionally, small sites may represent a range of activities often not found at larger more complex sites, including resource procurement or processing, and thus, smaller sites, such as this lithic scatter, can present information important to the prehistory of the region (NRHP Criterion D and CRHR Criterion 4).

Site S-3, which appears to be a small lithic procurement site, is more appropriately described as a lithic prospect. Only limited testing and possible removal of acceptable material appears to have occurred at this site. The source material at this location is limited to anomalous igneous clasts found within the site and vicinity. Giambastiani (2008) describes lithic procurement sites with major toolstone deposits in the Mojave Desert as occurring in two types of settings: bedrock outcrops and desert pavements. Site S-3 does not contain a major deposit of source material, but does occur within a developing desert pavement. Giambastiani (2008) further describes the commonalities of Mojave lithic procurement sites. The majority of recorded pavement quarry sites in the Mojave generally contain cryptocrystallines, although basalt and rhyolite are also found. Raw cobbles of the toolstone material are found at these sites. Little to no evidence of any other activities is extant and there is generally at least one discrete concentration of flaked stone debris found onsite (Giambastiani, 2008). Giambastiani (2008) also includes a discussion of the subsurface component for several Mojave pavement quarry sites located near Twentynine Palms, California. These subsurface components are found at the discrete lithic reduction loci within the lithic procurement sites. Giambastiani hypothesizes that the subsurface components are related to two variables based on observations at the above mentioned sites: the actual composition of the desert pavement and the quantity of flaked stone debris within the reduction area. Generally, larger flakes were observed on the surface of the reduction area, while the subsurface components consisted of smaller flakes.

Site S-3 is in good condition and is situated in an area with desert pavement on a surface developed on Plio-Pleistocene basin fill, a developing desert pavement. Site S-3 possesses similarities to the Mojave pavement quarries described above as there is no evidence that any activities other than lithic procurement occurred at the site and the site contains one discrete reduction locus. All of the flakes at this site were found in a very discrete concentration measuring less than 1x1 square meter. There is not, however, a major toolstone source located at Site S-3, nor is the toolstone found at this site a cryptocrystalline as described above. Rather, the available toolstone at this site consists of a few scattered cobbles of a yellow and red igneous material. The discrete reduction location contains less than 10 flakes; the majority of these flakes are decortication flakes. As is common with other procurement sites, there were no temporally diagnostic artifacts recorded at this site to place use of the site within any chronology. It seems extremely unlikely that the site has a subsurface component. Thus, its potential for contributing to the prehistory or history of the area appears to have been exhausted by this recording. Site S-3 does not appear to be eligible for the CRHR under any of the Criteria, nor the NRHP under any of the Criteria. Site S-3 does not qualify as a historical resource for the purpose of CEQA or as a historic property under Section 106. No further work is recommended.

S-4

Generally, small sites such as this lithic scatter represent one to a few episodes of activity and cannot be associated with any event or individual of local, regional, or national significance to be considered eligible for listing on the CRHR under Criteria 1 and 2 or the NRHP under Criteria A and B, nor do they contain any remains of architecture or even art (rock art) that would make the site eligible for consideration under Criterion 2 of the CRHR or Criterion C of the NRHP. However, these small activity sites are often isolated and, under the right circumstances, may present a body of data which is not necessarily colored by the complexities of a larger site (Glassow, 1985). Additionally, small sites may represent a range of activities often not found at larger more complex sites, including resource procurement or processing, and thus, smaller sites, such as this lithic scatter, can often present information important to the prehistory of the region (CRHR Criterion 4 or NRHP Criterion D).

Site S-4 is in good condition. As with many other sites in the study area, this site is situated on sandy alluvium eroded from the nearby dune field to the east, and a subsurface component cannot be ruled out on purely stratigraphic grounds. The limited number of artifacts consistently point to the site's function as one of lithic material testing and toolstone procurement, likely representing one episode of use, and limits this site's ability to answer important questions regarding the local or regional prehistory. Because the toolstone is coming from local, naturally occurring sources the site cannot answer any questions regarding settlement patterns or trade. There are no diagnostic artifacts or remaining organic materials that could be used to date the site and help to define the temporal use of the site. Also lacking are any tools or other types of artifacts that could answer questions of technology or ethnicity. Given the limited range of artifact types, consisting mainly of primary flakes and tested and natural cobbles, and the surface manifestation of these flakes, it is unlikely this site could offer any additional data to help explain or predict the nature of the prehistory of this region. Thus, its potential for contributing to the prehistory or history of the area has been exhausted by this recording. Site S-4 does not appear to be eligible for listing on the CRHR under any of the Criteria nor the NRHP under any of the Criteria. Site S-4 does not qualify as a historical resource for the purpose of CEQA or as a historic property under Section 106. No further work is recommended.

S-5

Generally, small sites such as this lithic scatter represent one to a few episodes of activity and cannot be associated with any event or individual of local, regional, or national significance to be considered eligible for listing on the CRHR under Criteria 1 and 2 or the NRHP under Criteria A and B, nor do they contain any remains of architecture or even art (rock art) that would make the site eligible for consideration under Criterion 2 of the CRHR or Criterion C of the NRHP. However, these small activity sites are often isolated and, under the right circumstances, may present a body of data which is not necessarily colored by the complexities of a larger site (Glassow, 1985). Additionally, small sites may represent a range of activities often not found at larger more complex sites, including resource procurement or processing, and thus, smaller sites, such as this lithic scatter, can often present information important to the prehistory of the region (CRHR Criterion 4 and NRHP Criterion D).

Site S-5 is in good condition. Because it is situated upon late-Holocene-age sandy alluvium, it is not feasible to exclude the possibility that the site has a subsurface component on stratigraphic grounds. The limited number of artifacts consistently point to the site's function as one of toolstone procurement or material testing, likely representing one episode of use, and limits this site's ability to answer important questions regarding the local or regional prehistory. Because the toolstone is coming from local, naturally occurring sources the site cannot answer any questions regarding settlement patterns or trade. There are no diagnostic artifacts or remaining organic materials that could be used to date the site and help to define the temporal use of the site. Also lacking are any tools or other types of artifacts that could answer questions of technology or ethnicity. Based on the sparse amount of lithic materials (only five flakes) and the fact they are of the same material source, this site likely represents a single episode lithic reduction site and has no potential to yield additional data to understand the prehistory or history of this region. Site S-5 does not appear to be eligible for listing on the CRHR under any of the Criteria nor the NRHP under any of the Criteria. Site S-5 does not qualify as a historical resource for the purpose of CEQA or as a historic property under Section 106. No further work is recommended.

S-6

Generally, small sites such as this lithic scatter represent one to a few episodes of activity and cannot be associated with any event or individual of local, regional, or national significance to be considered eligible for listing on the CRHR under Criteria 1 and 2 or the NRHP under Criteria A and B, nor do they contain any remains of architecture or even art (rock art) that would make the site eligible for consideration under Criterion 2 of the CRHR or Criterion C of the NRHP. However, these small activity sites are often isolated and, under the right circumstances, may present a body of data which is not necessarily colored by the complexities of a larger site (Glassow, 1985). Additionally, small sites may represent a range of activities often not found at larger more complex sites, including resource procurement or processing, and thus, smaller sites, such as this lithic scatter, can often present information important to the prehistory of the region (CRHR Criterion 4 or NRHP Criterion D).

Site S-6 is in good condition. The lithic material comprising this site is part of a gravel to cobble lag resting on Plio-Pleistocene valley fill, and it is unlikely that the site has a subsurface component. The limited number of artifacts consistently point to the site's function as one of toolstone procurement and lithic core reduction, likely representing one episode of use, and limits this site's ability to answer important questions regarding the local or regional prehistory. Because the toolstone is coming from local, naturally occurring sources the site cannot answer any questions regarding settlement patterns or trade. There are no diagnostic artifacts or remaining organic materials that could be used to date the site and help to define the temporal use of the site. Also lacking are any tools or other types of artifacts that could answer questions of technology or ethnicity. This site is interpreted as a single episode lithic reduction site. Thus, this site's potential for contributing to the prehistory or history of the area has been exhausted by this recording. Site S-6 does not appear to be eligible for listing on the CRHR under any of the Criteria nor the NRHP under any of the Criteria. Site S-6 does not qualify as a

historical resource for the purpose of CEQA or as a historic property under Section 106. No further work is recommended.

S-8

A small feature such as this cannot provide an association with any important local, regional or national figure or event making this site ineligible for consideration for listing on the CRHR under Criteria 1 or 2, nor the NRHP under Criterion A or B. The site is lacking any definitive engineering, architectural, or artistic features which would allow for consideration for listing on the CRHR under Criterion 3 or the NRHP under Criterion C. A small feature such as this lacks any context into either the historic or prehistoric periods meaning its potential for contributing to the prehistory or history of the area has been exhausted by this recording, making it ineligible for listing on the CRHR under Criterion 4 or the NRHP under Criterion D. The cairn does not appear to be eligible for listing on the CRHR under any of the Criteria nor the NRHP under any of the Criteria. Site S-8 does not qualify as a historical resource for the purpose of CEQA or as a historic property under Section 106. No further work is recommended.

S-10

This site appears to contain evidence of one or more limited episodes of lithic testing and procurement. Generally, sites lacking in a variety of artifacts and features such as this lithic scatter, may represent one to a few episodes of activity and cannot be associated with any event or individual of local, regional, or national significance to be considered eligible for listing on the CRHR under Criteria 1 and 2 or the NRHP under Criteria A and B, nor do they contain any remains of architecture or even art (rock art) that would make the site eligible for consideration under Criterion 2 of the CRHR or Criterion C of the NRHP. However, these types of limited activity sites are often isolated and, under the right circumstances, may present a body of data which is not necessarily colored by the complexities of a larger, more varied site (Glassow, 1985). Additionally, small or simple may sites represent a range of activities often not found at larger more complex sites, including resource procurement or processing, and thus, sites such as this lithic scatter, can often present information important to the prehistory of the region (CRHR Criterion 4 or NRHP Criterion D).

The northern portion of this site is situated in an area that has been eroded to a depth of approximately 30 cm, exposing alternating sandy and cobbly alluvial strata, the latter provided the source of toolstone exploited here. If the site has a subsurface component, it would necessarily lie stratigraphically above the cobbles, and therefore be of shallow depth at best. Thus, potential for contributing to the prehistory or history of the area may not have been exhausted by this recording. Further testing and analysis may be required in order to determine whether this site contains information or data that could answer important research questions relating to the testing and procurement of raw toolstone materials, and may be considered eligible for listing on the CRHR under Criterion 4 or the NRHP under Criterion D. Site S-10 should be considered potentially eligible pending further archaeological testing and should be avoided by all proposed ground-disturbing activities until data regarding subsurface potential has been gathered to make a more informed determination of eligibility.

S-11

Generally, small sites such as this lithic scatter represent one to a few episodes of activity and cannot be associated with any event or individual of local, regional, or national significance to be considered eligible for listing on the CRHR under Criteria 1 and 2 or the NRHP under Criteria A and B, nor do they contain any remains of architecture or even art (rock art) that would make the site eligible for consideration under Criterion 2 of the CRHR or Criterion C of the NRHP. However, these small activity sites are often isolated and, under the right circumstances, may present a body of data which is not necessarily colored by the complexities of a larger site (Glassow, 1985). Additionally, small sites may represent a range of activities often not found at larger more complex sites, including resource procurement or processing, and thus, smaller sites, such as this lithic scatter, can often present information important to the prehistory of the region (CHRH Criterion 4 or NRHP Criterion D).

Site S-11 is in good condition. This site is situated on sandy alluvium that is likely to be equivalent with Hayne's (1967) Unit G in the Las Vegas Valley. Therefore the possibility that the site has a subsurface component cannot be completely ruled out. However, the limited number of artifacts consistently point to the site's function as one of toolstone procurement and lithic core reduction, likely representing one episode of use, and this interpretation limits this site's ability to answer important questions regarding the local or regional prehistory. Because the toolstone is coming from local, naturally occurring sources the site appears to lack potential to answer any questions regarding settlement patterns or trade. There are no diagnostic artifacts or remaining organic materials that could be used to date the site and help to define the temporal use of the site. Also lacking are any tools or other types of artifacts that could answer questions of technology or ethnicity. Due to the small number of artifacts and the fact that they are consistent with a small, and likely limited resource procurement activity, the site's potential for contributing to the prehistory or history of the area appears to have been exhausted by this recording. Site S-11 does not appear to be eligible for listing on the CRHR under any of the Criteria, nor the NRHP under any of the Criteria. Site S-11 does not qualify as a historical resource for the purpose of CEQA or as a historic property under Section 106. No further work is recommended.

S-20

Although this historic refuse scatter is in fair condition and retains certain elements of integrity, it is wholly lacking in any significant context in which to evaluate the site. A simple, likely single episode, roadside dump of nine cans and three glass bottle bases cannot be applied to any known research questions important in defining the history of this area. The site cannot contribute any particular archaeological potential to be associated with an important event (CHRH Criterion 1 and NRHP Criterion A) or an important individual (CHRH Criterion 2 and NRHP Criterion B) within the local, regional, or national history. A simple debris scatter does not contain any information or potential to yield any information relating to Criterion 3 of the CRHR or Criterion C of the NRHP. Further, based on the limited surface scatter of cans and glass on the site, there is no potential to yield any significant information on local history (CHRH Criterion 4 and NRHP Criterion D). Additionally, this site appears solely composed of trash tossed on the ground, and it is therefore extremely unlikely that the site has a

subsurface component. Thus, its potential for contributing to the history of the area has been exhausted by this recording. Site S-20 does not appear to be eligible for listing on the CRHR under any of the Criteria nor on the NRHP under any of the Criteria. Site S-20 does not qualify as a historical resource for the purpose of CEQA or as a historic property under Section 106. No further work is recommended.

S-23

Generally, small sites such as this lithic scatter represent one to a few episodes of activity and cannot be associated with any event or individual of local, regional, or national significance to be considered eligible for the CRHR under Criteria 1 and 2 or the NRHP under Criteria A and B, nor do they contain any remains of architecture or even art (rock art) that would make the site eligible for consideration under Criterion 2 of the CRHR or Criterion C of the NRHP. However, these small activity sites are often isolated and, under the right circumstances, may present a body of data which is not necessarily colored by the complexities of a larger site (Glassow, 1985). Additionally, small sites may represent a range of activities often not found at larger more complex sites, including resource procurement or processing, and thus, smaller sites, such as this lithic scatter, can often present information important to the prehistory of the region (CRHR Criterion 4 and NRHP Criterion D).

Site S-23 is in good condition, but is sparse, consisting of less than two dozen flakes and no features or tools. The flakes appear as part of the moderate to sparsely distributed gravel lag on the surface, and it is unlikely that the site has a subsurface component. The limited number of artifacts consistently point to the site's function as one of toolstone procurement and lithic core reduction, likely representing one episode of use, and limits this site's ability to answer important questions regarding the local or regional prehistory. Because the toolstone is coming from local, naturally occurring sources the site cannot answer any questions regarding settlement patterns or trade. There are no diagnostic artifacts or remaining organic materials that could be used to date the site and help to define the temporal use of the site. Also lacking are any tools or other types of artifacts that could answer questions of technology or ethnicity. Thus, its potential for contributing to the prehistory or history of the area has been exhausted by this recording. Site S-23 does not appear to be eligible for the NRHP under any of the Criteria and does not qualify as a historical resource for the purpose of CEQA or as a historic property under Section 106. No further work is recommended.

S-AF-1

This site is a small simple lithic scatter located in an area of active deflation of alluvium deposits. The site is located in Nevada and within the site there are no diagnostic features or artifacts that would provide a temporal context for the occupation of the site. In fact, due to the high number of primary, decortication flakes, many of which appear to have come from the same core, this site may represent a simple testing of cores. Generally, sites lacking in a variety of artifacts and features such as this lithic scatter, may represent one episode of activity and cannot be associated with any event or individual of local, regional, or national significance to be considered eligible for listing on the NRHP under Criteria A and B, nor do they contain any remains of architecture or even art (rock art) that would make the site eligible for consideration under Criterion C

of the NRHP. However, these types of limited activity sites are often isolated and, under the right circumstances, may present a body of data which is not necessarily colored by the complexities of a larger, more varied site (Glassow, 1985). Additionally, small or simple sites may represent a range of activities often not found at larger more complex sites, including resource procurement or processing, and thus, sites such as this lithic scatter, can often present information important to the prehistory of the region (NRHP Criterion D).

Site S-AF-1 is in fair condition. The lithic material comprising this site is part of a gravel to cobble lag resting on Plio-Pleistocene valley fill, and it is unlikely that the site has a subsurface component. The limited number of artifacts consistently point to the site's function as one of toolstone procurement and lithic core reduction, likely representing one episode of use, and limits this site's ability to answer important questions regarding the local or regional prehistory. Because the toolstone is coming from local, naturally occurring sources the site cannot answer any questions regarding settlement patterns or trade. There are no diagnostic artifacts or remaining organic materials that could be used to date the site and help to define the temporal use of the site. Also lacking are any tools or other types of artifacts that could answer questions of technology or ethnicity. This site likely represents a single episode lithic reduction site. Thus, this site's potential for contributing to the prehistory or history of the area has been exhausted by this recording. Site S-AF-1 does not appear to be eligible for listing on the NRHP under any of the Criteria. Site S-AF-1 does not qualify as a historic property under Section 106. No further work is recommended.

S-AF-2

This site is a small simple lithic scatter located in an area of active deflation of alluvium deposits. There are no diagnostic features or artifacts that would provide a temporal context for the occupation of the site. In fact, due to the high number of primary, decortication flakes, many of which appear to have come from the same core, this site may represent a simple testing of cores. Generally, sites lacking in a variety of artifacts and features such as this lithic scatter, may represent one episode of activity and cannot be associated with any event or individual of local, regional, or national significance to be considered eligible for listing on the NRHP under Criteria A and B, nor do they contain any remains of architecture or even art (rock art) that would make the site eligible for consideration under Criterion C of the NRHP. However, these types of limited activity sites are often isolated and, under the right circumstances, may present a body of data which is not necessarily colored by the complexities of a larger, more varied site (Glassow, 1985). Additionally, small or simple sites may represent a range of activities often not found at larger more complex sites, including resource procurement or processing, and thus, sites such as this lithic scatter, can often present information important to the prehistory of the region (NRHP Criterion D).

Site S-AF-2 is in fair condition. The lithic material comprising this site is part of a gravel to cobble lag resting on Plio-Pleistocene valley fill, and it is unlikely that the site has a subsurface component. The limited number of artifacts consistently point to the site's function as one of toolstone procurement and lithic core reduction, likely representing one episode of use, and limits this site's ability to answer important questions regarding

the local or regional prehistory. Because the toolstone is coming from local, naturally occurring sources the site cannot answer any questions regarding settlement patterns or trade. There are no diagnostic artifacts or remaining organic materials that could be used to date the site and help to define the temporal use of the site. Also lacking are any tools or other types of artifacts that could answer questions of technology or ethnicity. This site likely represents a single episode lithic reduction site. Thus, this site's potential for contributing to the prehistory or history of the area has been exhausted by this recording. Site S-AF-2 does not appear to be eligible for listing on the NRHP under any of the Criteria. Site S-AF-2 does not qualify as a historic property under Section 106. No further work is recommended.

References Cited

- Glassow, Michael A. 1985. The Significance of Small Sites to California Archaeology. *Journal of California and Great Basin Anthropology*. 7(1):58-66l.
- Haynes, C. V., Jr. 1967. Quaternary geology of the Tule Springs area, Clark County, Nevada. In *Pleistocene studies in southern Nevada* (H.M. Wormington and D. Ellis, Eds.). Nevada State Museum Anthropological Papers 13: 15-104. Carson City.
- T. L. Jones, G. M. Brown, L. M. Raab, J. L. McVickar, W.G. Spaulding, D. J. Kennett, A. L. York, and P. L. Walker. 2004. Environmental Imperatives Reconsidered: Demographic Crises in Western North America During The Medieval Climatic Anomaly. In *Prehistoric California Archaeology and the Myth of Paradise* (edited by L. M. Raab and T. L. Jones) 12-32. The University of Utah Press, Salt Lake City.
- Lundstrom, S. C., S. A. Mahan, R. J. Blakely, J. B. Paces, O. D. Young, J. B. Workman and G. L. Dixon. 2002. *Geologic Map of the Mound Spring Quadrangle, Nye and Clark Counties, Nevada, and Inyo County, California*. U. S. Geological Survey, Miscellaneous Field Studies Map MF-2339. Version 1.0. Denver, CO.
- Mehringer, P. J., and C. N. Warren. 1976. Marsh, dune, and archaeological chronology, Ash Meadows, Amargosa Desert, Nevada. in Elston, R., ed., "Holocene environmental change in the Great Basin." *Nevada Archaeological Survey Research Paper* 6: 120-150.
- Mifflin, M.D., and Wheat, M.M. 1979. Pluvial Lakes and Estimated Pluvial Climates of Nevada. *Nevada Bureau of Mines and Geology Bulletin* 94.
- Quade, Jay, M. D. Mifflin, W. L. Pratt, W. McCoy, and L. Burckle. 1995. Fossil spring deposits in the southern Great Basin and their implications for changes in water-table levels near Yucca Mountain, Nevada, during Quaternary time. *Geological Society of America Bulletin* 107:213-230.
- Scheirer, D. S., D. S. Sweetkind, and J. J. Miller. 2010. Multiple phases of basin formation along the Stateline fault system in the Pahrump and Mesquite Valleys, Nevada and California. *Geosphere* 6(2): 93-129.
- Spaulding, W. G. 1991 A middle Holocene vegetation record from the Mojave Desert and its paleoclimatic significance. *Quaternary Research* 35: 427-437.

Wormington, H. M. and D. Ellis. 1967. *Pleistocene studies in southern Nevada*. Nevada State Museum Anthropological Papers 13. Carson City.

Wells, S. G., L. D. McFadden, and J. C. Dohrenwend. 1987. Influence of Late Quaternary climatic changes on geomorphic and pedogenic processes on a desert piedmont, eastern Mojave Desert, California. *Quaternary Research* 27:130-146.

Wells, Stephen G., R. Y. Anderson, L. D. McFadden, W. J. Brown, Yehouda Enzel, and J. L. Miossec. 1989. Late Quaternary paleohydrology of the eastern Mojave River drainage, southern California: Quantitative assessment of the Late Quaternary Hydrologic cycle in large arid watersheds. New Mexico Water Resources Research Institute Report No. 242. Las Cruces, New Mexico.