Hidden Hills Solar Electric Generating System (HHSEGS)

(11-AFC-2)

Data Response, Set 1A
(Response to Data Requests 1 though 50)

Submitted to the

California Energy Commission

Submitted by

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Introduction

Attached are responses from Hidden Hills Solar I, LLC, and Hidden Hills Solar II, LLC (collectively, "Applicant") to the California Energy Commission ("CEC") Staff's data requests numbers 1 through 50 for the Hidden Hills Solar Electric Generating System ("HHSEGS") Project. The CEC Staff served these data requests on October 17, 2011. The responses are grouped by individual discipline or topic area. Within each discipline area, the responses are presented in the same order as provided by CEC Staff, and are keyed to the Data Request number (1 through 50). New graphics or tables are numbered in reference to the Data Request number. For example, the first table used in response to Data Request 15 would be numbered Table DR15-1. The first figure used in response to Data Request 15 would be Figure DR15-1, and so on. Figures or tables from the HHSEGS Application for Certification ("AFC") that have been revised have "R1" following the original number, indicating revision 1.

Additional tables, figures, or documents submitted in response to a data request (supporting data, stand-alone documents such as plans, folding graphics, etc.) are found at the end of the Data Responses.

Air Quality (1–14)

Background – Air Quality Permit Application Process

A Determination of Compliance (DOC) analysis from Great Basin Unified Air Pollution Control District (GBUAPCD) will be needed for staff's analysis. Staff will need to coordinate with the applicant and District to keep apprised of any air quality issues determined by the District during GBUAPCD's permit review.

Data Request

1. Please provide copies of any official submittals and correspondence to or from the GBUAPCD that you have already submitted to the GBUAPCD if the substance is not contained in the AFC and any additional correspondence within 5 days of their submittal to or their receipt from the District. This request is to remain in effect until the Final Determination of Compliance is issued by the District.

Response: Applicant will provide copies of substantive District correspondence, including e-mail messages, related to the permit application within 5 days of submittal or receipt, provided that this correspondence does not contain information that is privileged or confidential. Copies will be provided until the Final Determination of Compliance is issued by the District. Copies of submittals to and correspondence from the GBUAPCD that we have exchanged with the District to date and that were not included in the AFC have been docketed (Log # 62098, dated 8/29/11; and Log# 62518, dated 10/5/11).

Background – Cumulative Impacts

The applicant's cumulative impact analysis, including information presented in Section 5.1.5 of the AFC, does not seem to include a list of permitted projects from the GBUAPCD. Staff needs to make sure that there are no other large stationary sources that have recently been permitted, or are in the permitting process near the site. Also, because this site is located so close to the California and Nevada Border, please include all projects in the Clark County (NV), and Nevada Department of Air Quality Management, Bureau of Air Pollution Control.

Data Request

2. Please confirm there are no projects so far from the GBUAPCD or other necessary agencies with large stationary source projects that will have permitted emissions, for projects with greater than 5 tons of permitted emissions of any single criteria pollutant. Include projects located within six miles of the project site that have been recently permitted, but did not start operation or are in the process of being permitted.

Response: Applicant requested information for a cumulative impact analysis from the GBUAPCD, Clark County Department of Air Quality and Environmental Management, and the Nevada Division of Environmental Protection, Department of Air Quality Management, Bureau of Air

Pollution Control ("Nevada DEP"). The request letters and any agency responses received before the AFC was filed were included in Attachment 5.1G-1 to Appendix 5.1G of the AFC.

To summarize, the GBUAPCD responded that "[t]here are no facilities in the District, other than the St. Therese project, within 6 miles of the perimeter of the Hidden Hills Ranch project." Nevada DEP responded with a list of active permits in the general project area. Attachment 5.1G-1 includes the list provided by Nevada DEP and a description of the analysis used to determine that none of the projects on the list provided by Nevada DEP is within 6 miles of the project site.

The Clark County response to the request for information regarding potential sources to be included in a cumulative impacts analysis was received on August 25, 2011 after the AFC had been filed, and was docketed on August 29. Clark County responded:

> We have five permitted sources in, or near, that hydrographic area, but, none of these are within the 6 miles perimeter of the site you have identified. In fact, it appears the closest permitted source is over 20 miles away. Our search of our records did not indicate any proposed authority to construct projects within the area for which we have received an application.

Copies of the agency correspondence, demonstrating that there are no projects meeting the criteria of the request, are provided in Attachment DR2-1.

Data Request

3. Please provide a cumulative impacts modeling analysis in consultation with energy commission staff, if necessary, based on the project list provided by GBUAPCD.

Response: As discussed in Data Response 2, there are no stationary source projects meeting the criteria, so no cumulative impacts modeling analysis is necessary.

Background – Baseline Site Conditions

In order to evaluate the air quality impacts from this project the current baseline conditions of the project site need to be understood.

Data Request

4. Please describe the types of activities that emit combustion and fugitive dust emissions on the site currently and the quantities of those emissions that occur from those activities.

Response: According to survey crews who have visited the project site, the site is mostly vacant, disturbed land. Portions of the site have been graded and a dirt road grid laid out for anticipated development as residential property, but no residential or other development has taken place within the project site boundaries. The only onsite activity that could currently emit combustion and fugitive dust emissions is casual vehicle traffic, which would be sporadic as there are no activities taking place on the property that would attract regular vehicle traffic and therefore cannot be quantified with any degree of accuracy.

Data Request

5. Please describe whether those activities will be permanently discontinued when the project is completed and estimate the reductions from the current onsite baseline emissions.

Response: Any activities currently taking place on the site will be permanently discontinued once construction commences and property line security fences are in place. As discussed in Data Response 4, because existing activity cannot be quantified with any degree of accuracy, no emission reductions can be estimated.

Background – Construction Activities' Emissions

The Application for Certification (AFC), table 5.1-31, page 5.1-48 states that construction equipment and activities may cause up to a maximum 375.7 pounds (lbs) per day of ozone precursors (349.8 lbs of oxides of nitrogen (NOx) and 25.9 lbs of volatile organic compounds [VOC]), and 190.9/37.8 lbs per day of particulate matter, PM10/PM2.5, respectively during construction of the project. It also states that the construction activities' related emissions are "…short term."; to imply that offset mitigation may not be needed. Also according to the AFC, page 5.1-47, construction of the facility will last for 29 months. During this time, the facility construction emissions (ozone precursors and particulate matter) can contribute to existing violations of the state ozone and PM10 air quality standards.

Data Request

6. Please identify additional mitigation measures to mitigate the impacts of construction related NOx, VOC and PM10/2.5 and PM10/2.5 precursor emissions. These may include a dust mitigation plan, Diesel-Fueled Engine Control, Dust Plume Response Requirement, Fugitive Dust Control, etc.

Response: The statement that emissions associated with construction activities are "short term" was in no way intended to suggest that mitigation would not be needed.

On page 5.1F-2 of Appendix 5.1F, Applicant proposed a list of measures intended to control potential emissions of fugitive dust. Prior to construction, Applicant will also prepare a dust mitigation plan and expects to implement diesel-fueled engine control conditions as are typically imposed by the CEC as part of its licensing proceeding. Since the CEC's standard construction mitigation conditions are sometimes custom-tailored for specific projects and/or sites, Applicant will work with the staff to ensure that a suitable set of conditions is established for HHSEGS. Further, our analysis reflects our expectation of what those conditions will look like based on our review of CEC decisions for previous, similar projects.

Background – Construction Emissions Calculations

The emission calculations use assumptions that require additional information to be confirmed by staff. The electronic version of Appendix 5.1F was only provided as a .pdf file. Staff needs the original spreadsheet file, with embedded calculations, to complete its review.

Data Request

7. Please provide the spreadsheet version, in electronic format, of the Appendix 5.1F Construction Emission Worksheets with the embedded calculations intact.

Response: The requested spreadsheet file contains trade secret information that is confidential and proprietary to Sierra Research, Inc. As such, this file, along with an application for confidential designation, has been submitted separately from this set of data responses pursuant to Section 2501 *et Seq.* of the Commission's Regulations.

Data Request

8. The construction emissions and impacts should be evaluated for the actual Tiered engines to be used during construction. Please identify the Tier level (Tier 3, 2, 1 or 0) of all of the off-road equipment and associated emission factors. If Tier 3 engines are the only Tier levels assumed for the engines listed, please provide a survey of at least three construction equipment vendors that would be able to provide the Tier level that was assumed to determine the emission factors in the AFC. Other projects have not been able to obtain Tier 3 powered vehicles for specialty vehicles such as cranes and other types of equipment.

Response: The construction impacts presented in the AFC assumed that all construction vehicles were equipped with Tier 3 or better engines, based on the effective dates of the respective nonroad engine standards. This approach was taken to match the construction equipment mitigation requirements developed by the CEC over the past few years for power plant projects. Specific Tier assumptions were shown in the construction emissions calculations attachment to the AFC (Appendix 5.1F, Attachment 5.1F-1); the specific table showing the requested information is included here as Table DR8-2-1 of Attachment DR8-2 for convenience.

At the October 25, 2011, data request workshop, Applicant raised a concern that the requested survey of construction equipment vendors would not provide useful information regarding the future availability of Tier 3 equipment because that availability is highly dependent upon the demand for Tier 3 - especially by other construction projects – at the exact time when the equipment would be needed for HHSEGS. Applicant agreed to develop a proposal for evaluating the impacts of a more likely construction vehicle fleet composition to account for the possibility that some of the vehicles may not be available with Tier 3 or 4 engines.

Based on information provided in the August 2011 Monthly Compliance Report for the Ivanpah SEGS project, we have determined that through the end of August 2011, about 18 percent of the construction equipment and 14 percent of the total engine horsepower used for that project is Tier 2-certified; 69 percent of the equipment and 75 percent of the horsepower is Tier 3-certified; and the rest is Tier 4 interim or Tier 4-certified. (Applicant did not account for Tier 0 and Tier 1 vehicles as there were only a few of those and the vehicles did not appear to be onsite for any significant period of time. Based on this assessment, and after consultation with CEC staff, Applicant has prepared a supplemental construction emissions impact analysis that assumes that 20 percent of the construction equipment horsepower comes from Tier 2 vehicles. For this analysis, Applicant first calculated emissions assuming that 100 percent of the construction vehicles will be equipped with Tier 2 engines. Applicant then increased the daily and annual emission rates used for the original project

construction impact modeling by 20 percent of the difference between the Tier 3/4 calculated emissions and the Tier 2 calculated emissions. These calculations are shown in Attachment DR8-1. These calculations show that while daily and annual NOx and CO emissions could be expected to increase if a significant fraction of Tier 2 vehicles are used during construction, emissions of other pollutants would remain essentially unchanged.

The results of the supplemental analysis are summarized in Table DR8-1. Predicted impacts that are different under the 20/80 supplemental scenario from those provided in the AFC are shown underlined. Predicted impacts from the Tier 3/4 scenario, as presented in Table 5.1-35 of the AFC, are shown in strike-out font for comparison.

TABLE DR8-1
Modeled Maximum Impacts From Onsite Construction Activities, Assuming 20% Of Offroad Vehicles are Tier 2-Certified

Pollutant	Averaging Period	Maximum Predicted Impact ($\mu g/m^3$)	Maximum Background Concentration ($\mu g/m^3$)	Total Concentration[a] ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	CAAQS ($\mu g/m^3$)
NO_2	1-hr (highest)	~~100.1~~ 133.5	117	~~217~~ 251	--	339
	1-hr (98th percent)	~~85.8~~ 88.0	80.8	~~167~~ 169	188	--
	Annual	~~3.4~~ 3.7	7.5	11	100	57
SO_2	1-hr	0.2	93.6	94	196	655
	3-hr	0.2	23.4	24	1300	--
	24-hr	0.05	13.1	13	--	105
	Annual	0.01	2.7	2.7	80	--
CO	1-hr	~~62.9~~ 66.8	1,750	~~1,813~~ 1,817	40,000	23,000
	8-hr	~~26.7~~ 28.3	1,333	~~1,360~~ 1,361	10,000	10.000
PM_{10}	24-hr	~~24.2~~ 29.3	96	~~120~~ 125	150	50
	Annual	1.4	14	15	--	20
$PM_{2.5}$	24-hr[b]	5.1	11.4	17	35	--
	Annual[c]	0.3	4.9	5.2	15.0	12

Notes:

[a] Total concentrations shown in this table are the sum of the maximum predicted impact and the maximum measured background concentration. Because the maximum impact will not occur at the same time as the maximum background concentration, the actual maximum combined impact will be lower.

[b] Background concentration shown is the three-year average of the 98th percentile values, in accordance with the form of the federal standard. Table 5.1F-8, footnote c.

[c] Background value shown is the three-year average of the annual arithmetic mean, in accordance with the form of the standard.

While the maximum modeled NO_2 and CO impacts with 20% Tier 2-certified construction equipment are predicted to be slightly higher than the impacts evaluated in the AFC, the higher impacts would not change any of the conclusions presented in the AFC; namely, that construction impacts alone for all modeled pollutants are expected to be below the most stringent state and national standards. With the exception of the 24-hour average PM_{10} standard, construction activities are not expected to cause an exceedance of state or federal ambient air quality standards. However, the background state 24-hour PM_{10} standard is exceeded in the absence of the construction emissions for the project.

Data Request

9. Please provide the input assumptions to obtain the OFFROAD and EMFAC2007 Model raw engine emission factors, the assumptions used to derive the equipment specific emission factors, and please provide the spreadsheets used to create the emission factors shown in Appendix 5.1F, with underlying equations intact.

Response: The OFFROAD2007 model was not used directly to produce the emission factors used in the analysis; rather, the underlying methodology built into the OFFROAD model was used. As noted in the detailed construction calculations included in the AFC,[1] this method is described in U.S.EPA's NONROAD model documentation ("Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling--Compression-Ignition," NR-009D, EPA-420-R-10-018, dated July 2010) [2]. The basic methodology is to multiply a zero-hour (certification) emission factor by transient adjustment factor, a deterioration factor, fuel sulfur adjustment factor (as applicable), and a load factor.

$EF_{adj} = EF_{ss} \times TAF \times DF$ [Equation 1, for HC, CO and NOx]

$EF_{adj} = EF_{ss} \times TAF \times DF - S_{PMadj}$ [Equation 2, for PM]

where:

EFadj = Final emission factor used in the analysis (g/hp-hr)
EFss = Zero-hour, steady state emission factor (g/hp-hr)
DF = Deterioration factor
TAF = Transient adjustment factor
SPMadj = Fuel sulfur adjustment factor (g/bhp-hr)

These adjustments are necessary to correct the engine certification emission factors (based on tightly-controlled laboratory conditions) to "real world" emission factors. Computation of the off-road emission factors is performed in the Excel workbook which is also provided. Deterioration factors are a function of the fraction of the vehicle's useful life expended; since there is no information available upon which to base a determination of historical construction vehicle use, the deterioration factors are assumed to be equal to 1 in these calculations.

Following is a sample calculation for a 215 bhp Tier 3 grader. The adjustment factors obtained from the NONROAD report tables are shown below:

TABLE DR9-1.
Adjustment Factors Used in Sample Calculation

Factor/Source	VOC	CO	NOx	PM_{10}
EF_{ss} (from Table A-4)	0.1836	0.7475	2.5	0.15
TAF (from Table A-5)	1.05	1.53	1.04	1.47
S_{PMadj} (from Equation 5)[3]	--	--	--	-0.0859

[1] Appendix 5.1F, Attachment 5.1F-1; the specific table showing the requested information is included here as Attachment DR9-1 for convenience.

[2] Available at http://www.epa.gov/otaq/models/nonrdmdl/nonrdmdl2010/420r10018.pdf

[3] The default factor of 0.33 wt% was used for soxbas; soxdsl is 0.0015 wt% reflecting CARB diesel fuel.

EFadj NOx = 2.5 g/bhp-hr * 1.04 * 1 = 2.60 g/bhp-hr
EFadj PM10 = 0.15 g/bhp-hr * 1.47 * 1 - 0.0859 g/bhp-hr = 0.1346 g/bhp-hr

The assumptions used in each EMFAC model run appear in the heading of the EMFAC output that was included in Appendix 5.1F, Attachment 5.1F-1 to the AFC. NOx, CO, VOC and SO2 emissions were based on EMFAC2007 V2.3 runs that used the following assumptions:

Scenario year: 2013 – All model years in the range 1969 to 2013 selected
Season: Annual
Area: Great Basin Valleys Air Basin[4] Average
I/M Status: COO Basic (2005) – Using I/M schedule for area 1 Alpine (GBV)

PM_{10} and $PM_{2.5}$ emissions were based on EMFAC2007 V2.3 runs that used the following assumptions:

Scenario year: 2013 – All model years in the range 1969 to 2013 selected
Season: Annual
Area: Statewide totals Average
I/M Status: Enhanced Interim (2005) – Using I/M schedule for area 59 Los Angeles (SC)

The fleet average emission factors for vehicles operating in the Great Basin Valley geographic area were used, except when such a result would yield an inventory too low to calculate accurate emission factors. [5] In these cases (that is, for PM_{10} and $PM_{2.5}$), EMFAC was rerun on a statewide basis, producing larger inventory and activity projections and thus a more accurate emission factor. All emission factors were averaged annually, using the default I/M program for the geographic area. It is noted that the I/M program settings do not affect the emissions from diesel-fueled vehicles, which represent the vast the majority of assumed construction-related vehicle activity.

The emission factors are calculated in the spreadsheet that is being provided with a request for confidential treatment as discussed under Data Response 7.

Background – Operating Emissions – Vehicle Mitigation Measures

Staff is concerned that the overall criteria pollutant air quality benefit of the proposed project's solar energy production is being at least partially cancelled by the project's fuel use emissions. Additionally, the emission factors assumed in the applicant's emission calculations appear to be overly conservative as staff will recommend a condition requiring that all site dedicated vehicles be new model year vehicles, which meet model year California emission standards, at their time of purchase/lease/etc. Staff also needs to understand what additional dedicated onsite vehicle mitigation the applicant would be willing to stipulate to, assuming such mitigation is available and cost effective.

[4] The Great Basin Valleys Air Basin is the geographic area that is under the jurisdiction of the GBUAPCD.

[5] For example, in the GBV run, PM_{10} emissions were 0.01 tons per day, which is the lowest value that registers on EMFAC. Because of EMFAC rounding conventions, that value could actually range from 0.005 to 0.0149 tons per day.

Data Request

10. Please revise the emissions calculations for the onsite dedicated vehicle exhaust emissions assuming only new model year vehicles are used for all vehicles dedicated to the site.

Response: Because of the nature of the vehicles that will be needed for mirror washing, Applicant has assumed that the vehicles will be diesel-powered heavy duty non-road vehicles equipped with Tier 4 engines (see Note 1 to Table 5.1B-11 of the AFC). Therefore, the calculations contained in the AFC already assume that the vehicles used for mirror washing will meet the latest emission standards at the time of purchase, and no revisions to the emissions calculations are necessary.

Data Request

11. Please identify whether or not the applicant would be willing to stipulate to a condition of certification that would require a review of available alternative low emission vehicle technologies, including electric and hydrogen fueled vehicles, and use of those technologies to replace the proposed diesel and gasoline fueled vehicles used for operations maintenance if lower emission alternative technology vehicles are both available and cost effective.

Response: No. Applicant believes that adequate mitigation will be provided by the use of the latest model year/tier vehicles.

Background – Operations – Equipment Refueling Emissions

The AFC indicates that there will be an on-site diesel tank for vehicle refueling at the site for the mirror washing vehicles, fire pump engine, and back-up generators. The AFC does not mention the use of an onsite gasoline refueling tank.

Data Request

12. Please indicate what will be proposed for refueling the dedicated on-site gasoline fueled equipment fleet.

Response: All of the onsite vehicle fleet (mirror washing vehicles) will be diesel-fueled. Applicant does not anticipate using any dedicated gasoline-fueled vehicles onsite during project operation, so no gasoline refueling facilities will be required. Gasoline will only be used by some of the equipment/vehicles during the construction phase of the project.

Data Request

13. Please indicate if the additional vehicle mileage required for refueling offsite, either driving vehicles to nearby retail gasoline stations or contracting fuel/lube trucks for onsite refueling, is considered in the total vehicle miles estimates and emissions estimates, or please correct these estimates accordingly.

Response: As discussed in Data Response 12, all of the onsite vehicle fleet (mirror washing vehicles) will be diesel-fueled and onsite refueling will be provided for this equipment. There will be no gasoline deliveries to the site during the operational phase of the project.

Background – GHG Analysis

Sulfur hexafluoride (SF_6) is one of the most potent greenhouse gases. SF_6 is often used for insulating and cooling of electrical equipment such as transformers, circuit breakers and switchgear. The project is identified to have a significant amount of electrical equipment that could use SF_6. While some of the electrical equipment is noted to be air cooled, the AFC GHG analysis does not include comprehensive information for all electrical equipment regarding if or how much SF_6 would be used. Staff needs to understand if SF_6 is a potential GHG emission from this project and the emission inventory of SF_6.

Data Request

14. Please provide an estimate of the SF_6 onsite inventory and leakage emissions both in operation and construction phases to complete the GHG emission estimates.

Response: The estimated onsite SF_6 inventory and leakage emissions during plant operations are accounted for in the GHG emissions calculations presented in Appendix 5.1B, Table 5.1B-13 of the AFC. As indicated in Note 6 to that table, SF_6 will be used in four new 230 kV breakers in the common area and in one generator circuit breaker at each power block. Estimates of the SF_6 contained in a 230 kV breaker range from 161 to 208 pounds depending on the manufacturer, while each generator circuit breaker will contain 24.2 pounds of SF_6. The IEC standard for SF_6 leakage is less than 0.5 percent; the NEMA leakage standard for new circuit breakers is 0.1 percent. In our calculations, we conservatively assumed a maximum leakage rate of 0.5 percent, resulting in estimated SF_6 emissions of up to 0.002 metric tons per year. Applying a GWP of 23,900, yields a CO_2-equivalent emission rate of under 48 metric tons per year.

No additional SF_6-containing equipment will be onsite during the construction phase.

Alternatives (15–16)

Background

Table 6.2-3 very generally compares the impacts of the two site alternatives to the HHSEGS project that the applicant carried forward for analysis. For each environmental topic (except for Socioeconomics) under the column, “HHSEGS,” the impact conclusion is stated as “less than significant.” Given that a less-than-significant impact under the California Environmental Quality Act (CEQA) does not require mitigation, the impact conclusions in the table imply that no mitigation is required for any impact identified in the Application for Certification (AFC).

Mitigation measures are proposed in the AFC to reduce significant or potentially significant impacts for the following environmental topics:

- Air Quality
- Biological Resources
- Cultural Resources
- Hazardous Materials Handling
- Noise
- Paleontological Resources
- Soils
- Traffic and Transportation
- Visual Resources
- Water Resources
- Worker Health and Safety

On April 26, 2011, the Inyo County Board of Supervisors adopted the Renewable Solar and Wind Energy General Plan Amendment (GPA) (GPA No. 2010-03), which included establishing Renewable Energy Land Use Designation Overlay Zones. On September 6, 2011, Inyo County rescinded the general plan amendment that established the overlay zones. This action by the County causes the proposed project and the two alternatives to be inconsistent with Inyo County’s designated land use and zoning districts for the sites. This inconsistency causes a potentially significant impact to land use based on the Appendix G checklist in the CEQA Guidelines.

Data Request

15. Please review the potential construction and operation impacts for the Calvada South and Trona alternative sites, and revise the estimated impact conclusions, given the absence of the Inyo County Renewable Energy Land Use Designation Overlay Zones.

Response: As indicated in a letter from Mike Monasmith of the California Energy Commission to Clay Jensen, BrightSource Energy, dated November 4, 2011, regarding Data Request Set 1B, the CEC indicated that Set 1A Data Requests 15 and 16 will be supplanted by forthcoming data requests in Set 1C, and therefore no response is necessary.

Data Request

16. Please review the potential construction and operation impacts of the HHSEGS project at the proposed site, and revise the estimated impact conclusions, given the absence of the Inyo County Renewable Energy Land Use Designation Overlay Zones.

Response: As indicated in a letter from Mike Monasmith of the California Energy Commission to Clay Jensen, BrightSource Energy, dated November 4, 2011, regarding Data Request Set 1B, the CEC indicated that Set 1A Data Requests 15 and 16 will be supplanted by forthcoming data requests in Set 1C, and therefore no response is necessary.

Socioeconomics (17–24)

Background – Fire Protection and Emergency Response

The project site is within the Southern Inyo County Fire Protection Department (SIFPD) jurisdiction. However, because SIFPD has limited resources (mostly volunteer staff) and the distant location of the project site from other fire stations in Inyo County (one station in the town of Tecopa and a temporary location in the area known locally as Charleston View), additional assistance would be brought in from the town of Pahrump, Nevada. According to the AFC, SIFPD has mutual aid agreements with Pahrump Valley Fire-Rescue Service (PVFRS) (Pahrump) and Nye County Fire Department (Pahrump) as part of Nye County Emergency Services (NCES), as well as one with Clark County (Las Vegas, Nevada) for responses requiring more assistance (Socioeconomics Section, pg. 5.10-17). Additional assistance can also be obtained from Round Mountain/Smoky Valley Fire Services in Nye County (Worker Health and Safety Section, pg. 5.16-21). The Bureau of Land Management (BLM) has a fire station located in Pahrump that covers all federal land including the project area in Inyo County. Their station in Apple Valley, CA would be the next responding station after SIFPD's two stations and Pahrump Valley Fire (Worker Health and Safety Section, pg. 5.16-21).

The AFC indicated the first response will come from a SIFPD fire response crew (volunteer) in the Charleston View area, but it is unclear if the fire response crew would be the first responder in case of a medical emergency on the project site. The AFC provides little information about who would be the first responder for medical emergencies. It would appear from the information in the AFC that PVFRS is equipped for such an emergency, but whether they would have the responsibility of being the first responder is not discussed. The AFC states that project operations staff would be trained as first responders, but no details are provided describing what their skill level would be or what their ability would be to respond to different types of emergencies at the project site (Socioeconomics Section, pg. 5.10-30).

The AFC notes that because of the remote nature of the area, the construction phases of the project may have minor impacts on fire resources and that the applicant is working with the Inyo County fire department to understand requirements and reduce any impacts to services (Socioeconomics Section, pg. 5.10-27).

So that staff can assess the ability of the first responder to respond to medical emergencies at the project site while maintaining acceptable response times, service ratios or other performance objectives, additional information is needed, as identified below.

Data Request

17. Please identify the first responder for medical emergencies at the project site, plus any other responders as part of a mutual aid agreement.

Response: Southern Inyo Fire Protection District (SIFPD), Tecopa Station (at 410 Tecopa Hot Springs Road) is the first responder for medical emergencies at the project site (Levy, 2011). The Tecopa Fire Station has 12 volunteer firefighters who all have first response medical training called Basic Life Support (BLS) training. There is one ambulance staffed by 3 personnel and a fire truck staffed by 2 personnel which would also likely respond to emergencies at the project site. The response time from Tecopa Station is approximately 30 minutes.

There is a mutual aid agreement between SIFPD and Pahrump Valley Fire Rescue Services (PVFRS) in Pahrump, Nevada. PVFRS has 40 full-time firefighters with three medical training levels: basic, intermediate, and advanced life support training. Upon issuance of a mutual aid request, PVFRS would respond to medical emergencies, such as trauma or industrial accidents with an Advance Life Support (ALS) ambulance, Heavy Rescue, or can request a helicopter (Lewis, 2011). The response time from any PVFRS station to the project site is approximately 30 minutes.

In the event that advanced medical care is required, the responding team would call Mercy Air paramedic to transport trauma patients to the University Medical Center located at 1800 West Charleston Blvd., Las Vegas. The response time for Mercy Air is 10 minutes. Patients with non-emergency and non-trauma type needs are typically transported to Desert View Hospital in Pahrump (360 South Lola Lane, Pahrump, Nevada).

A record of communication with the Southern Inyo Fire Protection District is provided in Attachment DR17-1. A copy of a record of communication between the California Energy Commission and Pahrump Valley Fire Rescue Services is provided as Attachment DR17-2.

Data Request

18. Please clarify what training or skill level plant operations staff would have as “first responder.” Would staff merely be an on-site point person to initiate a call for emergency response, or would staff be trained to handle certain emergencies on a triage-type basis? Please describe the type of incidents (emergency medical, fire, and/or hazardous materials incidents) the plant operations staff, as “first responders” would respond to?

Response: In accordance with the plant’s health and safety program, which is still under development, plant personnel in each shift will receive various levels of basic health and safety training, such as fire extinguisher use, Emergency First Aid, AED, and CPR. The necessary training is determined according to each job description and duties. Therefore, the number of plant personnel required to be trained and certified has not yet been determined. Employees handling hazardous materials will also be trained in accordance with Occupational Safety and Health Administration’s (OSHA) requirements appropriate to their job descriptions and duties. Materials handlers and first line emergency responders will receive hazardous materials training.

Data Request

19. Please provide the results of the applicant's work with the SIFPD to understand its emergency service requirements and to reduce any impacts to emergency services. Please describe the issues the applicant discussed with the SIFPD and any steps the applicant has taken to reduce impacts related to the provision of emergency medical services during project construction and operation, and any agreements between the applicant and SIFPD regarding provision of emergency services to the project site.

Response: Prior to filing the AFC, Applicant had meetings with Paul Postle, SIFPD Fire Chief to provide him with information on the project. However, he has since departed the SIFPD and was replaced by interim SIFPD Fire Chief Larry Levy. Applicant met with Chief Levy on October 25, 2011. At that meeting, the project was introduced and Chief Levy's initial concerns were discussed. The topics covered with Chief Levy ranged from training of responders to anticipated tax revenues from the project.

To address these topics, Applicant has facilitated a meeting scheduled for November 21 between Chief Levy and San Bernardino Division 3 Fire Chief Mark Pebbles. BrightSource's Ivanpah Solar Electric Generating System project is within the jurisdiction of Division 3. The Ivanpah project emergency response team will also attend this meeting. The purpose of this meeting will be to inform Chief Levy of the emergency response capabilities of the Ivanpah response team and Division 3. No agreements have been reached between the Applicant and SIFPD.

Background – Law Enforcement

The project site is within the jurisdiction of the Inyo County Sheriff's Office and has one sheriff station (#15) located on Highway 127 in the town of Shoshone. According to the Worker Health and Safety section in the AFC, the response time from Shoshone is approximately 30 minutes to 1 hour (Worker Health and Safety Section, pg. 5.16-22). In the Socioeconomics section of the AFC, the response time for officers on patrol or on call in the service area ranges between 0.5 hour to 3 hours and a response from the station would be 1.5 hours to 2 hours (Socioeconomics Section, pg. 5.10-16). Energy Commission staff reviewed the Inyo County General Plan and did not find any minimum response time standard or other performance measure for law enforcement services. The AFC notes that because of the remote nature of the area, the construction phases of the project may have minor impacts on law enforcement and that the applicant is working with the Inyo County Sheriff's Office to understand their requirements and reduce any impacts (Socioeconomics Section, pg. 5.10-27).

Staff noted the AFC did not discuss proposed on-site security measures during project construction and operation. The only reference to security was in the discussion of access roads and drive zones (Project Description Section, pgs. 2-4 and 2-5). The discussion identifies a 12-foot-wide unpaved path that would be constructed on the inside perimeter of the project boundary fence for use by HHSEGS personnel to monitor and maintain perimeter security.

So that staff can assess the ability of the Inyo County Sheriff's Office to respond to law enforcement calls at the project site while maintaining acceptable response times, additional information is needed, as identified below.

Data Request

20. Please clarify the estimated response time from the station in Shoshone to the project site. Is the estimated response time 30 minutes to 1 hour or 1.5 to 2 hours?

Response: The estimated response time from the station in Shoshone to the project site is 25 minutes for an in-progress Code 3 incident and 30 minutes for a non-Code 3 incident (Geiger). Code 3 incidents are those incidents that are potentially life-threatening. The 30-minute response time would apply whether the incident was in-progress or if it was a cold case that required the unit to take a report.

A record of communication with the Inyo County Sheriff's Department is provided in Attachment DR20-1.

Data Request

21. Given the remote location of the project site, the estimated response time for law enforcement calls at the project site, and the current unknown requirements of the Sheriff's Department, please provide a description of any security measures (e.g. security access gates, security personnel, video surveillance, etc.) proposed for the project that may deter or reduce incidents requiring law enforcement response.

Response: Perimeter fencing will be used around the perimeter of the project site. There will be a single security check point that is staffed 24 hours/day, 7 days/week by trained security personnel. All site personnel will undergo background checks and site access will be strictly controlled. The project will be operated in accordance with a security plan reviewed and approved by the CPM.

Data Request

22. Please provide the results of the applicant's work with the Inyo County Sheriff's Department to understand its law enforcement service requirements and to reduce any impacts to law enforcement services.

Response: The Applicant has had meetings with Inyo County senior management over the past 12 months discussing the HHSEGS project. At least one of these meetings included a representative with the Sheriff's Department. Since that time, a different Sheriff's Department representative, Sheriff William Lutze, has been tasked with representing the Sheriff's Department in its review of the HHSEGS project. A meeting was held with Sheriff Lutze on October 26, 2011 to introduce the project to him. Sheriff Lutze requested more information on the project, security measures during both construction and project operations, and what would be required of the Sheriff's Department.

In response to this request, Applicant is arranging a meeting between Sheriff Lutze and his counterpart with the San Bernardino Sheriff's Department. This meeting would include a

tour of the Ivanpah project (currently under construction) to familiarize Sheriff Lutze with the security measures at that facility.

Data Request

23. Please describe the issues the applicant discussed with the Inyo County Sheriff's Department and any steps the applicant has taken to reduce impacts related to the provision of law enforcement services during project construction and operation, and any agreements between the applicant and the Inyo County Sheriff's Department regarding the provision of law enforcement services to the project site.

Response: Please see Data Response 22.

Background – Construction and Operation Workforce

Table 5.10-16 in the AFC provides estimates of the construction workforce by month but does not include the specific trades or crafts required on a monthly basis for project construction. Table 5.10-18 in the AFC shows the available labor by specific trade and craft for Inyo County. For staff to determine whether the available workforce, as specified by trade or craft would be adequate for project construction, please provide the additional information identified below.

Data Request

24. Please provide a table similar to Table 5.10-16 in the AFC that identifies the number of construction workforce by craft or trade needed per month for project construction. Please provide the same table for the operation workforce.

Response: Table 5.10-16R1 (revised) is provided at the end of this section. Revising this table resulted in some changes to the Socioeconomic text of the AFC. The following changes (shown in redline, ~~strikeout~~ format) are provided below:

5.10.4.3.1 Construction Workforces

It is anticipated that most (75 percent) of the construction workforce will be drawn from Clark County and 20 percent from Nye County while the remaining (5 percent) will be drawn from Inyo County. The primary trades in demand will include pipefitters, electricians, construction managers, ironworkers, laborers, pre-assembly, carpenters, and unskilled labor. Table 5.10-16R provides estimates of construction personnel requirements for HHSEGS. Total personnel requirements during construction of HHSEGS facility (onsite personnel) will be approximately ~~18,465~~ 18,598 person-months. Construction personnel requirements for the site will peak at approximately 1,033 workers in Month 14 of the construction period.

5.10.4.3.4 Impacts to the Local Economy and Employment

[Modify the second paragraph as follows]

HHSEGS will provide about ~~$160~~ $161 million (in 2011 dollars) in construction payroll, at an average salary of $50 per hour (including benefits). The anticipated payroll for employees, as well as the purchase of materials and supplies during the construction period, will have a slight but temporary beneficial impact on the

economies of Inyo, Clark, and Nye counties. Assuming that 5 percent of the construction workforce will reside in Inyo County, it is expected that approximately ~~$8.0~~ $8.1 million in payroll will stay in Inyo County. Assuming, that 95 percent of the construction workforce will reside in either Clark or Nye county, it is expected that the remaining ~~$152~~ $153 million in estimated construction payroll will remain in these two Nevada counties. These additional funds will cause a temporary beneficial impact by creating the potential for other employment opportunities (indirect and induced employment) for local workers in other service areas, such as transportation and retail.

The following Table DR24-1 shows the job classifications for the operations workforce.

TABLE DR24-1
HHSEGS Plant Operation Workforce

Department	Personnel	Shift
Operations	42 MWM operators 24 Technicians 6 Support staff	All night shift, 21 per plant 2 shifts, 6 technicians each shift, per plant. 3 per plant, day or night shift?
Warehouse & Maintenance	13 personnel	12-hour night shift for maintenance?
Administration	31 Administration staff 4 Support staff	Day shift
Total	120	

MWM = mirror washing machine

TABLE 5.10-16R1
Construction Personnel by Month

Month	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	TOTAL
Craft/Job Category																															
Craft-Day Shift																															
Boilermaker	0	0	0	0	0	0	0	0	38	72	120	202	222	223	224	234	218	163	154	130	130	114	42	29	12	10	8	6	0	0	2,351
Carpenters	0	6	8	8	20	20	20	20	19	16	16	14	16	15	14	15	15	15	10	4	4	4	8	8	8	8	8	8	4	4	335
Cement Finisher	0	0	0	8	40	41	43	50	52	52	52	54	55	55	55	55	55	52	52	48	45	45	20	0	0	0	0	0	0	0	929
Electrician	0	16	35	39	163	219	230	239	233	238	217	195	197	199	199	209	215	219	216	208	186	183	63	62	50	40	24	10	10	4	4,118
Equipment Operator	0	8	18	20	26	26	26	24	19	15	14	14	10	8	17	18	18	16	16	15	13	13	6	5	4	4	2	1	1	0	377
Instrument Tech	0	0	0	0	0	8	15	17	18	18	18	19	18	16	20	21	19	19	19	17	15	13	16	12	10	10	3	2	1	1	345
Insulation Installer	0	0	0	0	8	16	30	32	32	33	33	34	35	34	35	37	36	34	34	32	28	28	11	18	18	5	4	2	1	1	611
Iron Worker	0	2	3	5	32	28	28	31	24	8	8	9	6	2	2	2	2	2	9	7	5	4	10	8	7	6	3	0	0	0	253
Laborer	36	28	24	24	30	24	24	20	19	14	14	12	10	8	10	10	10	10	10	10	13	12	5	4	4	4	4	4	4	4	405
Millwright	0	0	0	0	0	0	0	0	0	0	6	10	8	6	4	14	14	12	10	10	5	2	5	4	4	2	2	1	0	0	119
Painter	0	0	0	1	3	3	3	3	3	3	3	4	4	4	4	4	4	4	3	3	3	3	1	1	2	2	0	0	0	0	68
Pipefitter	0	0	0	34	232	238	269	287	287	285	253	217	223	223	226	232	232	237	243	239	217	211	82	74	62	40	30	10	9	6	4,698
Plumbers	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	0	0	0	0	0	0	0	0	33
Craft-Day Shift Subtotal	**36**	**60**	**88**	**139**	**556**	**625**	**690**	**725**	**746**	**756**	**756**	**786**	**806**	**795**	**812**	**853**	**840**	**785**	**778**	**724**	**665**	**633**	**269**	**225**	**181**	**131**	**88**	**44**	**30**	**20**	**14,642**
Craft-Swing Shift (Heliostat Assembly)																															
Carpenters	0	0	0	0	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0	0	0	0	0	0	0	72
Electrician	0	0	0	0	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	0	144
Equipment Operator	0	0	0	0	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0	0	0	0	0	0	0	72
Instrument Tech	0	0	0	0	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	0	0	0	0	0	0	0	0	216
Iron Worker	0	0	0	0	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	0	0	0	0	0	0	0	0	396
Millwright	0	0	0	0	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	0	0	0	0	0	0	0	0	180
Craft-Swing Shift Subtotal					**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1,080**
Total Craft	**36**	**60**	**88**	**139**	**616**	**685**	**750**	**785**	**806**	**816**	**816**	**846**	**866**	**855**	**872**	**913**	**900**	**845**	**838**	**784**	**725**	**693**	**269**	**225**	**181**	**131**	**88**	**44**	**30**	**20**	**15,722**
Non-craft [1]	4	15	19	25	27	35	35	35	35	36	38	38	38	41	41	41	41	41	41	40	39	38	37	36	33	30	27	20	8	5	939
Owner & Others	4	15	25	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	35	30	25	15	10	5	1,004
Compliance Support	80	80	30	30	30	30	30	30	30	30	30	30	30	80	80	30	30	20	20	10	10	10	5	5	5	5	5	5	5	5	820
Transmission Line	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	37	0	0	0	0	0	0	0	0	0	0	0	74
Gas Line	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	30
Linear Compliance Support	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	6	0	0	0	0	0	0	0	0	0	0	0	9
SUBTOTAL SITE	**124**	**170**	**162**	**234**	**713**	**790**	**855**	**890**	**911**	**922**	**924**	**954**	**974**	**1016**	**1033**	**1024**	**1011**	**986**	**1012**	**874**	**814**	**781**	**351**	**306**	**254**	**196**	**145**	**84**	**53**	**35**	**18,598**
Offsite Linears[2]																															
Transmission Line	0	0	0	0	0	0	0	0	0	0	0	3	3	3	15	36	39	0	0	29	10	10	6	0	5	0	0	0	0	0	159
Gas Line	0	0	0	0	0	0	0	0	0	0	0	2	2	21	21	21	21	21	0	0	0	0	0	0	0	0	0	0	0	0	109
Linear Compliance Support	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	6	6	3	0	4	4	4	4	0	2	0	0	0	0	0	45
TOTAL WORKFORCE	**124**	**170**	**162**	**234**	**713**	**790**	**855**	**890**	**911**	**922**	**924**	**959**	**979**	**1,046**	**1,075**	**1,087**	**1,077**	**1,010**	**1,012**	**907**	**828**	**795**	**361**	**306**	**261**	**196**	**145**	**84**	**53**	**35**	**18,911**

Notes: [1] Non-craft workers are the non-union superintendents and construction personnel onsite.
[2] Workforce for linears was included for use in determining cumulative impacts.

Traffic and Transportation (25-31)

Background

Title 14, Aeronautics and Space, Code of Federal Regulations, Part 77(9) requires an Applicant to notify the Federal Aviation Administration (FAA) of the construction of structures with a height greater than 200 feet AGL. The HHSEGS AFC Section 2.0 - Project Description, page 2-7, states that the proposed project would include a solar power tower structure approximately 620 feet tall. The solar receiver steam generator (SRSG) located at the top of the solar power tower structure would be approximately 130 feet tall, resulting in an overall height of approximately 750 feet.

Energy Commission staff needs information regarding the applicant's completion of FAA Form 7460-1, Notice of Proposed Construction or Alteration and an applicant-secured FAA Determination of No Hazard to Air Navigation. At this time, staff has not been provided with a completed FAA Form 7460-1 or an applicant-secured FAA Determination of No Hazard to Air Navigation. Therefore, proposed impacts related to inconsistency with FAA Form regulations are unknown at this time. This information is necessary prior to Final Staff Assessment publication.

Data Request

25. Please provide a schedule for completion of the FAA 7460-1 requirements.

Response: The FAA Form 7460-1 was submitted to the FAA on March 30, 2011. HHSEGS received a Determination of No Hazard to Air Navigation for Solar Unit 1 and Solar Unit 2 on September 9, 2011.

Data Request

26. Please provide a copy of the applicant's completed FAA form and transmittal letter to FAA.

Response: A separate FAA form was completed online for each solar tower. Copies of the FAA applications are provided in Attachments DR26-1 and DR26-2.

Data Request

27. Please provide a copy of the FAA's determination.

Response: The FAA's Determinations of No Hazard for Solar Unit 1 and Solar Unit 2 are contained in Attachments DR27-1 and DR27-2.

Background

According to the AFC, the light reflected from the boiler would introduce two areas of glowing light in the daytime sky. These areas of glow would represent new elements in the daytime sky that would be seen by travelers on the surrounding transportation

corridors (Interstate 15, State Route 127, Tecopa Road and State Route 160), residents in Charleston View, and residents in the rural residential area south of Pahrump.

If a heliostat were to malfunction and project its beam laterally across the solar plant it would presumably pass beyond the plant boundary and present an actinic hazard, including retinal damage, to observers on the ground, including plant personnel. Systems controlling the heliostats are described (page 5.13-23), but discuss operational issues rather than heliostat malfunctions.

Data Request

28. Please describe the range of movement (beginning and ending positions) for the heliostats during normal and emergency operation modes and during malfunction including the following (and any others) as applicable:

- Night stowage position.
- Morning startup.
- Evening shutdown.
- Reducing solar input to avoid overheating the receiver.
- Load (power output) reduction.
- Loss of AC Station Power.
- Mirror washing.

Response: The presumption of potential injury in the Background to DR 28 is incorrect. Under normal heliostat operation, or if a heliostat were to malfunction, a heliostat will not project its beam beyond the plant boundary and will not present an actinic hazard, including retinal damage, to observers on the ground or to plant personnel. The response below discusses heliostat movement. Data Response 30 provides a discussion of heliostat control mechanisms.

The heliostats have two drives that allow them to rotate along two degrees of freedom (azimuth and elevation). The azimuthal range is the full rotation along the vertical axis. The elevation range is from 0 (vertical mirrors, heliostat pointing horizontally) to 90 degrees (horizontal mirrors, heliostat pointing to the zenith). Heliostat movements cannot stray from these.

The wind protection and default position (called the "safe" position or orientation) is the 90-degree elevation - the mirrors being in horizontal position facing the sky. This position minimizes the risk of damage from large wind loads and is also the default orientation of the heliostats in case of loss of communication with the plant's control system or dysfunction of the plant's control system. With the solar field in "safe" position, at the ground level, the flux concentration will be low, similar to the sun’s reflection on a lake.

The night stowage ("sleep") position is a vertical position.

For normal operation, the heliostats will orient themselves according to their position in the field, day of the year, and time of day in order to reflect the sun rays either on the receiver ("tracking" orientation) or on an area nearby (far enough from the tower and receiver to free them from radiation but close enough to allow entering quickly the receiver – this is called the "standby" orientation.)

All transitions from orientation to orientation are performed by the heliostat with a safe "path" that prevents reflected sunrays from reaching any restricted area.

For morning startup, each heliostat will rotate along its two axes before sunrise in order to reach the "standby" position, which is specific to its position in the field and the day of the year. This can also be performed safely during daylight hours using a safe path as described above.

In the evening, after sunset, the converse movement is performed, in which the heliostat rotates along its two axes from its last position (either a "standby" position or a "tracking" position) to its "sleep" position. The field can be shutdown before sunset if necessary, as its heliostats will use the safe path to reach their sleep position without reflecting sunrays on restricted areas.

Reducing solar input to avoid overheating the receiver is performed by reorienting the heliostats from their "tracking" orientation to their "standby" orientation. This operation takes between a few seconds to a minute, depending on the position of the heliostat in the field, day of the year, and time of the day.

Load reduction can be performed from the side of the heliostats by reducing solar input as described above (switching the appropriate number of heliostats from "tracking" to "standby").

The heliostats are powered by a super-capacitor (primary power supply) connected to an individual photovoltaic panel located at the top of the heliostat, and are therefore unaffected by loss of AC Station Power in their capacity to move and to power their individual controller.

Washing is performed with the heliostats in a vertical position. The azimuth of the heliostats will be dependent on the path of the washing machine within the solar field.

All movements of the heliostats are very slow. No movement of the heliostat can exceed 11 degrees per minute (i.e., 0.03 RPM) whatsoever, in azimuth and the whole elevation movement cannot take less than 22 minutes. Furthermore, the heliostats have autonomous power and an autonomous controller allowing them to respond to loss of communication with the plant's control system or failure of the plant's control system by moving autonomously to the appropriate safe orientation.

Data Request

29. Please address potential solar radiation exposure hazards (in terms of total reflected solar energy (kW/m^2) and the reflected luminance in lux) and mitigation measures for normal and emergency operation modes as applicable for both individuals (including in vehicles and residents) and the effects to wildlife.

Response: In normal operation, only the area of the receiver (near the top of the tower) will receive concentrations of solar radiation. Locations on the ground, areas surrounding the footprint

of the plant or airspace will not receive solar radiation concentrations above that of direct sunlight. Therefore, in normal plant operation, there is no potential for any solar radiation exposure hazard to motorists, residents or non-avian wildlife. The potential effect on birds, if any, will be addressed separately. This safe operation will be achieved with the following design and precautions:

- *Safe orientation as default orientation* – as explained in Data Response 28, heliostats default to the safe orientation common to the whole field in all cases of malfunctions detected by the heliostat's controller, which ensures protection in most cases of malfunctions;
- *Safe path from any orientation to any other orientation* – as explained in Data Response 28, when heliostats change their orientation, they choose a "path" which avoids reflected sunrays on all unintended areas (at least the tower and power block, and other designated sensitive areas).
- *Normal operation* - all the sunlight is reflected either on the receiver or the "standby" areas – located near the receiver – so that no other location receives solar radiation
- *Removal of flux due to high winds and all other known scenarios* – These are considered normal operation and covered by the operations mentioned above.

While it is theoretically *possible* for a malfunctioning heliostat to concentrate solar radiation on a position outside the perimeter of the plant, this possibility will be eliminated in practice by adding any known sensitive point, such as a road or residence to the list of forbidden areas within each heliostat's controller. This way, each heliostat individually will avoid aiming reflected sunrays at the sensitive area which ensures that there will be no concentration of solar radiation on it. Therefore, there is no potential solar radiation exposure hazards and the reflected luminance for normal and emergency operation modes to motorists, residents and non-avian wildlife.

To ensure that the heliostats will be operated in a way that avoids the possibility for inadvertent direction of unacceptable levels of light toward ground level locations surrounding the project site, Applicant could prepare a Heliostat Positioning Plan (HPP) similar to that implemented for the Ivanpah Solar Electric Generating System. The HPP would identify heliostat movements and positions, including those that would occur during reasonably possible malfunctions, which could lead to potential exposure of observers at locations outside the site. The HPP would include a description of how the programmed heliostat operation would avoid potential exposure of viewers outside the site to unacceptable levels of reflected light. The HPP would also include a monitoring plan that would obtain field measurements in response to legitimate complaints, verify that the plan would avoid creation of hazards related to reflected light, and provide requirements and procedures to document, investigate, and resolve legitimate complaints.

Data Request

30. Please describe the control mechanisms, including availability of on-site maintenance personnel, which will avoid heliostat movements or malfunctions that may produce hazards to human and wildlife.

Response: Please refer to the responses provided above to DR 28 and DR 29 for heliostat range of movement. As stated above, neither heliostat movements nor malfunctions will pose a hazard to motorists, residents or non-avian wildlife. The potential impacts on birds, if any, will be addressed separately. Each heliostat controller can be programmed to eliminate any known sensitive point, such as a road or residence to the list of forbidden areas within each heliostat's controller. Additionally, heliostats will only rotate around themselves very slowly (less than 0.03 RPM) and they have a clearance aboveground aimed at avoiding ground collision. Any potential hazards from heliostat movements are limited to the ground areas corresponding to each heliostat's footprint (about 20 sqm below each heliostat). Malfunctions cannot lead to faster movements because of the transmission gears in the azimuthal drive which reduce the initial motor speed by a factor of more than 7,000 and because of an elevation drive which similarly reduces the initial motor speed so that the complete elevation movement of 90 degrees takes more than 20 minutes (average speed of 4 degrees per minute).

Most heliostat malfunctions will lead to the heliostat's movements to cease completely (e.g. loss of power, bad connection, electronic component failure) or move to safe position. A heliostat monitoring system in the control room would immediately inform plant operators of a heliostat malfunction. The heliostat would then be repaired or moved to safe position.

In rare situations, heliostat malfunction can lead the heliostat to move at the speeds specified earlier – but never above these speeds – until reaching safe position (either the high or low extreme of the elevation range, 90 degrees or 0 degrees, both of which are equipped with such mechanical limit switches) or until running out of power, whichever comes first. This doesn't present a hazard in terms of movement which is within the nominal range and speed.

It is important to note that the hardware of each heliostat operates independently; therefore any malfunction would be local and would not affect other systems.

Background

The AFC discusses compliance with Federal Aviation Administration (FAA) aviation safety lighting for the towers. The discussion in the Visual Resources Section (page 5.13-22) states that “This lighting will consist of flashing white strobe lights that will be installed at the tops of the towers and at three levels on the tower shafts. Because of the large diameter of the towers, four lights will be installed at each level. These lights will be operated both at night and during the day.”

Data Request

31. Please provide revised Figures 2.2-2a and 2.2-2b-Solar Plant 2, Elevation or a new figure showing the elevations at which the aviation safety lighting will be installed and a symbol for the lights in the legend. Indicate how this meets FAA regulations.

Response: Figures 2.2-2a and 2.2-2b-Solar Plant 2 have been revised to show the aviation safety lighting. Copies of the revised figure 2.2-2a-R1 and 2.2-2b-R1 are attached.

Visual Resources (32-37)

Background

In consultation with Energy Commission staff on April 27 and August 2, 2011, it was agreed that the visual analysis would benefit from an additional Key Observation Point (KOP) on the historic Old Spanish Trail. Importantly, the need for an additional KOP was supported by comments made by the Pahrump Paiute tribe members during these pre-filing meetings.

Data Request

32. Please provide a new KOP-7, on the location of the Old Spanish Trail after consultation with the Tecopa Chapter of the Old Spanish Trail Association and Energy Commission Staff. The view should be nearby to, or at the same location of, the southern Charleston View location, as was discussed during the April 27, 2011 meeting. A staff conversation with the Old Spanish Trail Association Tecopa Chapter President, Jack Prichett, indicated that several segments of the trail in the Pahrump Valley, and specifically the Charleston View area, have been previously identified and mapped, and may differ from that shown on DeLorme maps or other available maps. Please provide a photograph of existing conditions and a visual simulation of the project from this KOP.

Response: The location of KOP 7, the new KOP requested by CEC Staff, is identified on Figure DR32-1. Figure DR32-2 provides a photograph of the existing view from this location and a simulation of this view as it would appear with the proposed Project in place.

The photo from this viewpoint was taken on April 27, 2011 at the suggestion of CEC staff. This viewpoint is located southwest of Charleston View on Garnet Road, an unpaved road that extends south from Tecopa Road, and which provides access to 2 Hk Road, an unpaved road that skirts the northern boundary of the Pahrump Valley Wilderness Area. This viewpoint is located 1.75 miles south of Tecopa Road. It is intended to represent a view seen by the small numbers of recreational users who might travel up onto the bajada southwest of Charleston View to hunt, to visit the nearby Pahrump Valley Wilderness Area, or to travel on the network of unpaved roads that extends to the southwest into the California Valley. Coincidentally, this viewpoint is also located at a point where Garnet Road is crossed by an unpaved road that extends in a southwesterly direction across the Pahrump Valley in the area to the south of Charleston View.

GIS map data obtained directly from the National Historic Trails Department of the United States Park Service identifies the Old Spanish National Trail as following the alignment of this road in this area. Thus, according to the information provided by the National Park Service, the new KOP 7 view would also represent a view on the alignment of the Old Spanish National Trail. As directed by Commission Staff in this Data Request, contact was made with Jack Pritchett, the President of the Tecopa Chapter of the Old Spanish Trail Association to obtain data that the Tecopa Chapter may have developed related to the

alignment of the trail. Mr. Pritchett indicated that using data collected with GPS units, the Tecopa Chapter had mapped approximately 11 km in the region between Emigrant Pass and the Nevada State Line, and that the group is just approaching Charleston View in its efforts. He indicated that he would not be able to release the trail alignment data the Chapter has collected so far until this release is approved by the Chapter's board.

Although the Tecopa Chapter's trail location data is not available at this time, it is safe to assume that the view from the new KOP 7 provides a reasonable idea of the view from the Old Spanish National Trail in that it is on the specific alignment that the National Park Service National Historic Trails Department has identified. In addition, it is quite likely that in this area of open desert where there are no major obstructions, the route of the trail may not have been firmly fixed, and that travelers may well have moved through the area within a relatively wide corridor, rather than on a highly fixed path.

Background

During the August 2, 2011, pre-filing outreach meeting with the Native American constituency from the Pahrump Paiute and Las Vegas Paiute Tribes, interest was indicated in having a KOP view from the Nopah Wilderness Range toward the project site.

Data Request

33. Please provide a new KOP-8, in the Nopah Wilderness Range, after receiving comments from the Pahrump and Las Vegas Paiute Tribal officials and after consultation with Energy Commission Staff. The view may or may not be similar to the view previously identified by CH2MHill as VP6. The view from the Nopah Wilderness Range is intended to represent the Native Americans' visual area of concern looking toward the project site. Please provide a photograph of existing conditions and a visual simulation of the project from this KOP.

Response: As stated in Applicant's November 7, 2011 Notice letter, the Applicant agrees to this request if the following conditions can be met:

(1) If the Applicant is permitted to directly confer with Pahrump and Las Vegas Paiute tribal officials and the Staff regarding the selection of the KOP;

(2) If a KOP can be identified that is mutually agreeable to the Pahrump tribal officials, Las Vegas tribal officials, Staff and the Applicant; and

(3) If the selected KOP meets the Commission's established criteria as a location which provides a representative view that would be experienced by the general viewing public, or in this instance, a representative view from a location that is actually experienced by Native Americans who live nearby or visit the project area. KOPs are photographs of "key" locations within the project area that are highly visible to the public — for example, travel routes, recreational and residential areas that are actually traveled or used by a significant number of people.

The Applicant has no objection to providing an additional KOP that satisfies these criteria. If these criteria are not acceptable to the Staff or the parties with whom the Applicant will consult, then the requested information is not reasonably available to the Applicant and the Applicant reluctantly objects to Staff Data Request 33.

Background

Section 3.2 Transmission System Engineering, Onsite Facilities, describes the onsite transmission lines from Solar Plants 1 and 2. Figure 3. 2-1, Onsite Gen-tie Lines, shows the path of the transmission lines as they exit the Solar Plants and make their way to the switchyard. Section 3.2.1 describes the length of proposed overhead, aboveground transmission lines as 1.9 miles from Solar 1 and 0.6 mile from Solar 2.

Data Request

34. Please update Figure 3.2-1 or provide a new figure showing the location(s) of the proposed onsite transmission poles and indicate approximate spacing in feet. (This information is required by other technical disciplines, including Biological Resources, Cultural Resources, Transmission System Engineering and Visual Resources).

Response: Please see new Figure DR34-1, Approximate Transmission Pole Placement. The project's switchyard and gas metering station, as shown in this figure, have been relocated south of the location submitted in the AFC, to be more central. At this location, the number of onsite transmission poles is increased by 2 additional poles, to a total of 18. Their approximate spacing is shown in the figure and ranges between 300 feet and 900 feet. Relocating the switchyard and gas metering station to the south results in a slight change to the onsite construction duration. The change is too small to affect the workforce loading provided in AFC Table 5.10-16, Construction Personnel by Month (which was expanded in response to Data Request 24). Therefore, no change in peak annual air pollutant emissions is expected. Maximum daily NOx and PM10 construction equipment emissions for the project are expected to occur in late summer/early fall of 2013 (July through October; see Table 5.1F-1 and Attachment 5.1F-1 of the AFC). The minor additional construction that would result from the relocation of these facilities is expected to occur in the winter of 2013, and therefore, is not expected be concurrent with the peak construction emissions months already evaluated. The air quality impacts of construction as addressed in the air quality section of the AFC are therefore not expected to be affected. The relocation has no impact on Biological Resources, since plant avoidance has not been proposed as a viable mitigation measure for this project. In addition, the relocation has a benefit related to Cultural Resources by avoiding certain features described in the materials that must be filed with a request for confidentiality. The relocation has no affect on the other environmental disciplines addressed in the AFC.

Data Request

35. Please provide a revised simulation for KOP-3 (view from the Proposed Saint Therese Mission) that includes the onsite transmission poles and lines.

Response: As Figure DR34-1 indicates, the power generated by Solar Plants 1 and 2 will be conveyed from the Solar Plants through the areas devoted to the heliostat arrays by means of underground transmission lines. The underground line from Solar Plant 1 will transition to overhead at the eastern edge of the Solar Plant 1 heliostat array, and from there, will continue overhead along the eastern edges of the Solar Plant 1 and 2 heliostat arrays until reaching the switchyard. The transmission line from Solar Plant 2 will be nearly entirely

underground, with its only overhead segment consisting of a 300-foot span located between the terminus of the underground line and the connection to the proposed switchyard. Based on a close review of Figure DR34-1 and the current simulated view from KOP-3, it was determined that the point at which the transmission lines from both power block units transition from underground to aboveground would be outside the view of KOP-3. This determination was confirmed through preparation of a GIS plot of the solar plant and transmission line facilities on which the view cone seen from KOP-3 was superimposed. Because the aboveground portions of the transmission lines will not be visible in the view from KOP-3, there is no need to revise the simulation of the KOP-3 view to add overhead transmission lines.

Background

Table 5.13-4 in the AFC shows a solar tower height of 620 feet. The text on page 2.7 of the AFC, page 5.13-20 of the AFC and verbal presentations have indicated a height of 750 feet.

Data Request

36. Please confirm the height of the proposed solar towers including Solar Receiver Steam Generator (SRSG) represented in the AFC visual simulations.

Response: When the height of the Solar Receiver Steam Generators (SRSGs) is taken into account, the height of the solar towers is confirmed to be 750 feet above finished grade. This is the height that was depicted in the visual simulations submitted in the AFC. Small appurtenances, such as a small maintenance crane, silencers, additional lighting, and/or a lighting protection rod, will be located on top of the SRSGs, but these small pieces of equipment will be no more than 10 feet in height.

Background

The view from KOP-1 represents the motorist's perspective from westbound traffic on Tecopa Road (in Nevada). The AFC states that the undulating topography in the middle ground would block any direct view of the solar collectors, and therefore no adverse effects of glint or glare will occur. However, there may be other locations along Tecopa Road (travelling in either direction) where the topography will allow for direct views of the solar collectors, and therefore the presence of glint or glare may have an adverse affect.

Data Request

37. Please provide a discussion of potential mitigation measures to eliminate or minimize the potential for adverse glint and glare effects to motorists traveling along Tecopa Road. Mitigation measures might include a solid wall, fencing or other landscape screening elements, such as plantings. These measures would occur on site, and may include the eastern, western and southern property boundaries.

Response: As described below, because the project will not create glint and glare conditions that will adversely affect travelers on Tecopa Road, there is no need to implement

mitigation measures such as a solid wall, fencing, of landscape screening elements for minimizing or eliminating these effects.

This data request presupposes that the heliostats will create glint and glare that will be visible at the ground level to travelers along Tecopa Road. This presupposition is incorrect. As described in detail in the response to Data Request 29, the heliostats are designed to reflect sunlight toward the solar receiver at the top of the tower, and the mirrors are programmed to be operated in a way that their reflectivity would never be directed toward ground level viewers located outside of the project site. As the response to Data Request 29 points out, under some infrequent circumstances, it could be possible that heliostats that are not in operation might reflect sunlight onto ground level areas within the project site. However, in cases in which this might occur, the level of light concentration will not be high because the heliostat surfaces will be shaded to some degree by surrounding heliostats, reducing the amount of light that is reflected. In any case, because of the orientation of the heliostats inward, toward the solar tower, under this rare scenario, the light would not be directed outward from the project site, and thus would not create glint and glare conditions that would adversely affect roadway users.

To ensure that the heliostats will be operated in a way that avoids the possibility for inadvertent direction of unacceptable levels of light toward ground level locations surrounding the project site, Applicant could prepare a Heliostat Positioning Plan (HPP) similar to that implemented for the Ivanpah Solar Electric Generating System. The HPP would identify heliostat movements and positions, including those that would occur during reasonably possible malfunctions, which could lead to potential exposure of observers at locations outside the site. The HPP would include a description of how the programmed heliostat operation would avoid potential exposure of viewers outside the site to unacceptable levels of reflected light. The HPP would also include a monitoring plan that would obtain field measurements in response to legitimate complaints, verify that the plan would avoid creation of hazards related to reflected light, and provide requirements and procedures to document, investigate, and resolve legitimate complaints.

An additional factor that the Commission should be aware of is that from much of the segment of Tecopa Road east of the California/Nevada state line, the heliostats will not be visible at all. This can be seen in Figure 37-1, a map that indicates the potential visibility of the heliostat arrays in the area surrounding the project site. The areas in light purple, which includes much of the area along Tecopa Road east of the California/Nevada state line, are areas in which the heliostat fields will not be able to be seen.

The heliostat fields will be visible from Tecopa Road between the California/Nevada state line and the point at the western edge of the Pahrump Valley where the road turns to the southwest. Because most of this area is flat and at the same elevation as the fields of heliostats, what travelers will see in most of this area will be the back sides of the heliostats, which will appear to create a low, blank wall across the landscape. The simulations for KOPs 3 and 4 provided in the AFC illustrate that in the flat valley areas around the site, the heliostats are low enough in height that in views where there is intervening desert vegetation, the heliostats will not be readily visible in views across the desert floor. In places where the highway passes immediately adjacent to the heliostat array for Solar Plant 2, the heliostats will be set back from the road, and separated from the highway right-of-way by a 20-foot strip that will be planted in an informal manner with species of shrubs that are characteristic of the area. Although over time, these shrubs will provide some measure of

screening of views from the road toward the heliostats, the intent of this landscaping is not to create a total visual screen. Instead, the intent is to frame the view along the road, to divert attention away from the heliostats and to soften the visual transition between the roadway corridor and the heliostats. In any case, glint and glare will not be an issue in this area because any light that might be reflected at ground level will be directed toward the interior of the site.

In the higher elevation areas along Tecopa Road at the west side of the valley, the heliostat fields will be viewed at an oblique angle, making them appear as lake-like forms on the valley floor. The simulation of the view from KOP 6 provides a typical example of views from these areas. In these views, the heliostat fields may appear reflective, however, because the reflected light will be directed up at the solar receiver steam generators, the heliostat fields will not be the source of glint or glare that would affect travelers along this portion of the highway.

Waste Management (38)

Background

The Phase I Environmental Site Assessment lists a small portion of the proposed project site that was used as an orchard. The orchard was located in the southern most portion of the site. The historical use of this area suggests that pesticides and herbicides were used on the site.

Data Request

38. Please provide detailed information concerning the orchard: include type of crops, dates of operation, approximate size of the orchard, list of structures associated with the orchard, and possible pesticides or herbicides used at the site.

Response: The small, abandoned orchard is located in the south-central portion of the project site. The approximate location is shown on Figure DR38-1. The orchard was approximately 10 acres in size. A representative of the Mary Wiley Trust, which currently owns the land, states that the orchard's operation began around 1980 and ceased in 1999, when the caretaker who maintained the orchard passed away.

Most of the orchard area was used for growing of peaches. The variety of peaches was the "last chance peach." In addition, melons may have been grown on the portion of the site closest to Tecopa Road.

There are no buildings or structures presently occupying the orchard area and no known former buildings associated with operation of the orchard. The only feature is an old well located on the south side of the property, near Tecopa Road.

There is no known use of pesticides or herbicides associated with the orchard.

Soil and Water Resources (39–50)

General Background

The applicant proposes to meet Hidden Hills Solar Energy Generating System (HHSEGS) project water needs with groundwater from the Pahrump Valley groundwater basin. The project would require up to 288 acre-feet per year (AFY) for project construction and 140 AFY for operation. The Pahrump Valley groundwater basin is currently in severe overdraft (HHSEGS 2011). Absent project effects, basin water levels directly beneath the proposed site could fall approximately 20 feet over the next 30 years from existing agricultural and domestic uses. Superimposed project pumping could result in a potential cumulative water level drop of up to 50 feet of total drawdown at the project site over the next 30 years.

The current pumping of the groundwater basin is resulting in significant impacts. Preliminary review of the AFC and supporting documentation indicates the additional proposed project pumping will also result in significant direct and cumulative impacts to other users in the basin. The impacts would occur in the form of local drawdown effects on adjacent well owners and an ongoing reduction in basin storage. Other potential impacts include subsidence and effects on springs supported by groundwater.

Background - Pahrump Valley Groundwater Basin Overdraft and Mitigation

Both California and Nevada residents share the Pahrump Valley groundwater basin. Settlement and water use in the basin has occurred primarily on the Nevada side of the basin. Many of the water rights in the Nevada side of the basin were established prior to implementation of Nevada's statewide groundwater water rights system, where land owners must acquire a water use permit prior to pumping. Domestic users do not require water rights and therefore, total basin demand is not accurately described by water rights. Furthermore, a significant portion of the water rights in the Pahrump Valley are not currently being exercised. Nevada has established a safe yield for the Pahrump groundwater basin of about 12,000 AFY. The current pumping of the basin likely far exceeds this safe yield.

California has no such water rights system. In California, overlying landowners have the right to install wells and pump groundwater for reasonable and beneficial uses. Preliminary review of available information shows there is little to no water level data available for the California side of the basin, in comparison to data from the Nevada portion of the basin. To mitigate impacts, the applicant proposes to secure water rights of up to 400 AFY for the life of the project through purchase from existing water rights holders in Nevada. The availability of water rights that could be retired and thus be used to offset project water use is unclear. The terms of the water rights purchases and how much water use they would actually retire may also be difficult to resolve and could put in to question the viability of the proposed mitigation.

Viable mitigation opportunities are further complicated by the price of water rights in the Pahrump Valley basin. The Nye County Water Resources Plan claims that the fair market value of water in the Pahrump Valley is $7,000 per acre-foot (Buqo 2004). With an estimated yearly average for water use of 150 acre-feet, the cost of water rights required to mitigate project impacts to basin storage may therefore be as high as $1,000,000.

Opportunities to offset project water use and reduce the project's contribution to overdraft may exist on either side of the state line. The potential for offset is far more likely to be available in Nevada given the current higher water use and system of water rights in Nevada, and lack of groundwater management in California. Agricultural landuse retirement may be a source of water use mitigation in both California and Nevada.

Data for characterization of the Pahrump Valley groundwater basin is limited. Staff will continue to research the availability of water use and basin data for both the California and Nevada side of the Pahrump Valley groundwater basin. Additional analysis could lead to additional or alternative mitigation measures not currently considered or defined.

Data Request

39. Please provide documentation showing what water rights are available for purchase to offset project water use and provide a report discussing the status of negotiations to purchase water rights.

Response: Applicant has committed to offset project water use in order to mitigate potential impacts to groundwater and to resources that may depend on groundwater. (Please note that the reference to 400 acre-feet per year in one of Applicant's technical reports was made in error.) Water right acquisition is a possible means to offset project water use, and it is one of several options that are being evaluated (see response to Data Request 40 below). Applicant is developing a mitigation plan which will describe its proposed mitigation for the HHSEGS. It anticipates submitting the plan in January 2012.

Applicant does not understand or agree with Staff's statement in the General Background to Data Request 39, which states that drawdown of an additional 20 feet is expected from HHSEGS, and that the project could worsen groundwater drawdown by an additional 30 feet. Based on the studies and analysis provided with the AFC (for example, see Appendix 5.15G), the worst-case scenario shows a maximum drawdown of 14.9 feet at the center of the cones of depression, but that severe cone of depression becomes much more shallow at the project boundary.

Data Request

40. Please describe other viable mitigation measures that may exist in California or Nevada to offset project water use including retirement of land used for agricultural activities.

Response: As described above in response to Data Request 39, a detailed mitigation plan is being developed and is anticipated to be submitted in January 2012. Viable mitigation approaches currently under consideration are as follows:

- Retirement of active water rights by purchasing the water right (apart from the land).
- Retirement of inactive water rights by purchasing the water right (apart from the land). Water rights exist for a substantial amount of groundwater that is not currently being pumped.
- Retirement of active water rights by purchasing the land along with its water rights. The land likely would be sold after project decommissioning.
- "Forbearance" agreements with water users to limit or cease pumping for all or a portion of the project's lifetime. Rights are not acquired, but the offset is achieved by binding agreement.
- Water conservation measures that result in a demonstrated water use efficiency savings. Examples include installing center-pivot or drip irrigation systems.
- Agreements with water users to shift to crops that use less water.

Groundwater mitigation is most likely to occur in the Nevada portion of the Pahrump Valley groundwater basin, where groundwater use is heaviest (far greater than in California).

Data Request

41. Where mitigation does not include purchase of water rights, please include pump records, electricity records, fuel consumption records, crop production records, or other means of verifying water use. Include letters of intent from property owners, contractual agreements, deed restrictions, proof of purchase, or other documentation that provides assurance that mitigation can be implemented and measured.

Response: As described above in response to Data Request 39, a detailed mitigation plan is being developed and is anticipated to be submitted in January 2012. Applicant has committed to offset project water use in order to mitigate potential impacts to groundwater and to resources that may depend on groundwater. As part of the verification process, Applicant understands that it will be expected to provide detailed water use information in order to demonstrate how project pumping is being offset.

Background – Local Drawdown Mitigation for Wells in the Pahrump Valley Groundwater Basin

The AFC states that the applicant will mitigate for local drawdown impacts by lowering pumps or re-drilling the wells of local land owners. The applicant has not provided information which shows which wells would be affected by project pumping and what the potential change in well yield would be. Staff needs additional information to characterize typical well construction in the valley and estimate what magnitude of drawdown will result in a significant impact to other pumpers in the basin.

Data Request

42. Please provide all available well logs and information about wells within a 0.5-mile of the boundary of the 1-foot drawdown contour interval of the most conservative cone of depression (Scenario 2, Appendix 5.15G, Groundwater Modeling Technical Memorandum, July 20, 2011 (Cardno Entrix 2011).

Response: Cardno ENTRIX determined the Area of Review as the extent of the 0.5-mile boundary surrounding the 1-foot drawdown contour from the most conservative groundwater modeling and overlaid this contour on a map of the area (refer to Figure DR43-1 referenced in the response to the following question).

Please note that the Area of Review extends into Inyo County, California, where well logs are generally not available to the public because the information is considered confidential. In California, well completion logs must be filed with the Department of Water Resources per Water Code Section 13751, and these logs are generally not available for public inspection without approval of the well owner per Water Code Section 13752. Water Code Section 13752 states: "Reports made in accordance with paragraph (1) of subdivision (b) of Section 13751 shall not be made available for inspection by the public, but shall be made available to governmental agencies for use in making studies, or to any person who obtains a written authorization from the owner of the well. However, a report associated with a well located within two miles of an area affected or potentially affected by a known unauthorized release of a contaminant shall be made available to any person performing an environmental cleanup study associated with the unauthorized release, if the study is conducted under the order of a regulatory agency. A report released to a person conducting an environmental cleanup study shall not be used for any purpose other than for the purpose of conducting the study."

In summary, because of the confidential nature of well logs in California, logs from the Inyo County, California wells are not available.

To obtain available well logs and information within the Area of Review in Nevada, Cardno ENTRIX reviewed the following online data sources:

- Nye County Nuclear Waste Repository Project Office website (http://www.nyecounty.com/GWE/GWE_WE1_wellmap.htm)
- The United States Geologic Survey Groundwater Watch website (http://groundwaterwatch.usgs.gov/countymaps/NV_023.html)
- State of Nevada, Division of Water Resources website (http://water.nv.gov/index.cfm)
- Nye County Nevada website (http://www.co.nye.nv.us/)
- Nevada Bureau of Mines and Geology: University of Nevada Reno (http://www.nbmg.unr.edu/Oil&Gas/ScannedWellLogs.html)

Results of the search indicate that well data are not available within the Area of Review from the above data sources. Detailed information and logs were also not available for site wells (refer to BrightSource Energy, Hidden Hills Project Interim Assessment Report (AFC Appendix 5.15D), with the exception of one site well referred to as the Orchard Well. Layne Christiansen performed a video log of this well and the results were included in AFC Appendix 5.15. The Orchard Well is a 20-inch-diameter screened well with a total depth of 361 feet below land surface (bls). According to the video log, vertical and horizontal perforations were observed between 0 and 361 feet bls. The Orchard Well was measured to have a static water level of 107 feet bls in March 2011. No lithologic data exist, but the lithology can be inferred from the construction of the well that unconsolidated materials were penetrated.

Based on the review of online well information, the wells that have available construction and lithologic information that are located nearest to the project site are well numbers NC-GWE-PV-4 and NC-GWE-PV-5. These wells are located approximately eight miles north of the Area of

Review. Well NC-GWE-PV-4 is a 180-foot deep well that maintained a static water level of 75.4 feet bls in March 2011. The screened interval of this well is between 70 and 150 feet bls. Well NC-GWE-PV-5 is a 170-foot deep well that maintained a static water level of 68.8 feet bls in March 2011. The screened interval of this well is between 65 and 145 feet bls. The two well logs indicate that the 'Lean Clay' was the only stratigraphic unit penetrated during their construction. Data obtained from the online review are provided as Attachment DR42-1.

A total of 251 possible structures were found on Google Earth within the Area of Review as shown on Figure DR43-1 (see also response to Data Request 43, below). It is likely that residences located outside of water utility service areas in the Pahrump Valley have private wells, although no confirming data were available at the sources searched.

Background - Subsidence

The AFC describes subsidence fissures on site and in the general site vicinity. Researchers dePolo et al (dePolo 1999) have mapped similar fissures in the Pahrump Valley and indicate they are likely related to subsidence due to groundwater withdrawal. It is possible, given past and current groundwater pumping in the basin, that subsidence could be continuing and project pumping could exacerbate subsidence conditions. It is unclear, however, where subsidence is occurring on the site and whether any resources or structures could be affected by subsidence. Staff needs additional information on the regional distribution and rate of subsidence and identification of resources that could be impacted by subsidence.

Data Request

43. Please provide a map and description of all structures that exist within 0.5-mile of the boundary of the 1-foot drawdown contour interval of the most conservative cone of depression (Scenario 2, Appendix 5.15G, Groundwater Modeling Technical Memorandum, July 20, 2011 (Cardno Entrix 2011)).

Response: Please refer to Figure DR43-1 for a map showing the locations of visible structures and/or potential structures. The locations of structures were mapped using Google Earth (latest view) and Google Street View (when necessary) to confirm the presence of a structure. Figure DR43-1 shows the locations of all visible parcels where structure(s) were identified. The grid is centered on the proposed facility and extends to the modeled 1-foot drawdown contour plus 0.5 miles. Within the Area of Review there are approximately 130 parcels with potential structures that include both residential buildings and commercial properties. The majority of the structures appear to be single family residences. Commercial uses include small scale agriculture, automotive scrap yards, gun ranges, a race track, and retail. No confirmed industrial uses were identified.

Data Request

44. Please provide a map showing the mapped and regional patterns of subsidence. Include on the map indications of areas where the maximum and average amounts of subsidence have occurred and future anticipated trends of subsidence may occur.

Response: A review of published data from Nye County, Nevada, and Inyo County, California, does not indicate specific locations of subsidence, with the exception of descriptive locations of fissures in

the town of Pahrump from the Nye County Water Resources Plan (Buqo, 2004). Further, the report "*Ground-Water Storage Depletion in Pahrump Valley, Nevada-California, 1962-1975, USGS Water-Supply Paper 2279*" (Harrill, 1986) includes groundwater modeling results that project potential subsidence from consolidation of fine grained sediments based on groundwater depletion and storage values of the underlying aquifer.

The Miscellaneous Field Studies Map MF–2339, prepared by Lundstrom, et al. (2002) was reviewed to determine the presence of tension cracks in the vicinity of the site. A detail of the map is presented as Figure DR44-1. There are no tension cracks shown on the project site. The nearest tension cracks are located approximately two miles west of the site in sections 7 and 18, T22N, R10E. The tension cracks are part of a cluster of tension cracks along a north-south trending zone approximately two miles wide that occurs near the western margin of the valley. Tension cracks have been associated with sediments that lie above abrupt changes in bedrock topography such as at the margins of a basin (Buqo 2004).

Figure DR44-2 illustrates estimated locations of known fissures interpolated from the description provided in the Water Resources Plan (Buqo, 2004) plotted on the potential subsidence projection (Harrill 1986). Figure DR44-2 also includes an overlay of the 1-foot drawdown contour from the most conservative (low assumed transmissivity) 25-year modeling simulation (AFC Appendix 5.15G, Figure 6). A review of this figure shows that the 1-foot contour of the projected conservative 25-year drawdown from the project site does not intersect projected areas of significant or maximum subsidence. Further, Figure DR44-3 shows the referenced 1-foot drawdown contour overlain on a map of water level declines between 1913 and 1975 (Harrill, 1986). The identified fissures within the town of Pahrump are located in or immediately adjacent to areas that had significant historic water level declines.

Significant water level declines over the past 50 to 60 years are well known and are evident from Pahrump Valley well data (Figure DR44-4; see also Buqo, 2004, and Figure 10 of AFC Appendix 5.15D). Four monitoring sites located nearest the Hidden Hills project site indicate declines from 30 to 60 feet. These monitoring sites are located outside of the 1-foot drawdown contour from the project site's most conservative model simulation. Because the drawdown projected from project pumpage is less than one foot where it would intersect the area that has experienced historic drawdown of 30 to 60 feet, and since this is part of a conservative modeling effort, the potential additional drawdown is considered negligible.

Work conducted by Buqo (2006) evaluated the groundwater gradients in the Pahrump Valley. The groundwater gradient data were used to assess the potential influence of the Pahrump Valley Fault Zone (PVFZ) on the potentiometric surface. The hydraulic gradient in the PVFZ was lower compared to the overall gradient of the valley. Some of the available data suggest that the fault may act as a hydraulic flow barrier (Comartin 2010). The presence of the Pahrump Valley fault system and the associated small basin located west of the fault system could reduce the propagation of the cone of depression from groundwater withdrawals at the project site. The presence of this fault zone between the project site and areas of projected subsidence reduces any potential of added subsidence risk as a result of project related groundwater pumping.

Results of the review of information regarding potential subsidence, historic water level declines, hydraulic influences of the Pahrump Valley Fault Zone, coupled with projected water level drawdown from site withdrawals, indicate that the potential for subsidence as a result of project pumping is negligible.

Additionally, the geotechnical report submitted with the AFC (Hidden Hills Solar Facility, Inyo County, California, Ninyo & Moore, February 17, 2011) indicated that ground surface lineations were observed onsite which "appear to have been caused by ground fissures". The report further states that test pits (TP-6 and TP-7) were excavated across two of the lineations. Results of the test pits did not indicate the presence of ground fissures. The report also indicates that the nearest mapped fissure zones are located between two and eight miles from the project site. Considering that neither of these excavations revealed ground fissures, and that fissures have not been previously mapped by others at or near the site, there is no existing documentation of the presence of onsite fissures associated with subsidence.

Data Request

45. Please describe how much subsidence may occur in the area where existing structures may be affected.

Response: The locations of existing structures and a plot of the conservative groundwater modeling drawdown contours, based on site withdrawals, are shown on Figure DR43-1. The maximum drawdown at any identified structures is about 9 feet, and the majority of structures are located in areas with drawdown ranging between about 7 feet to less than 1 foot. The Pahrump Valley area has experienced declining water levels since 1913 of 60 feet or more. The relatively small additional drawdown based on a conservative model of site withdrawals will not result in adverse impacts to structures.

Data Request

46. Please discuss whether there could be any change in surface gradients that would change the direction and volume of surface water drainage that could affect existing structures or other resources.

Response: As previously discussed, the potential for subsidence as a result of the relatively small drawdown from site withdrawals is negligible. No changes in surface gradients or surface water drainage patterns are expected as a result of project pumping.

Data Request

47. Please discuss any monitoring and mitigation that may be required to address subsidence that may be exacerbated by project pumping.

Response: As discussed in responses to previous questions, the potential for subsidence is negligible. During the course of the project, one or more of the onsite project wells will be used to track water levels. The data from these measurements will be compared to modeled drawdown and used in conjunction with other monitoring data from Pahrump Valley to assess if there is any potential of subsidence associated with project pumping. The scope and details of the monitoring program will be established in consideration of specific site conditions.

Background - Springs

Staff understands there are numerous springs in the Pahrump Valley Groundwater Basin that have historically flowed under artesian conditions. Current studies show water level declines in the groundwater basin have resulted in termination of flow to many springs. Although water levels have declined and springs have ceased to flow, it

is possible water levels are still shallow enough to support important groundwater-dependent vegetation systems. Staff is concerned that if water level declines accelerate, vegetation may be impacted at historic spring sites. Staff needs additional information on whether groundwater-dependent vegetation is present at the spring sites, and whether water levels could be affected by the project such that groundwater-dependent vegetation could be impacted.

Data Request

48. Please provide a map and description of all springs that exist within a 0.5-mile of the boundary of the 1-foot drawdown contour interval of the most conservative cone of depression (Scenario 2, Appendix 5.15G, Groundwater Modeling Technical Memorandum, July 20, 2011 (Cardno Entrix 2011)).

Response: This response, while addressing question DR-48, also provides background for the responses to DRs 49 and 50 as well. For the purposes of this data response, the study area is defined as an area within Pahrump Valley defined by a radius extending 0.5 miles beyond the -1.0 ft isopleth in the current groundwater response model Figure DR43-1, which shows modeled drawdown of the water table resulting from project-related well use. The northern limit of this circle lies at about 36.09° N Lat., in the southern portion of the developed area surrounding Pahrump, Nevada.

Figure DR-48-1, Groundwater-dependent Vegetation in the Study Area, provides the location of the identified documented historic springs within the study area, including those areas thought to have discharged within approximately the last century based on geological grounds (that is, spring mounds not substantially eroded). Table DR48-1 provides a list and summary description of these areas of historic groundwater discharge. There are only a handful and none currently flow, although shallow-groundwater dependent vegetation survives near all. This vegetation, dominated by mesquite, generally shows more dieback closer to Pahrump.

TABLE DR48-1
List and Summary Description of Areas of Historic Groundwater Discharge

Spring	° N Lat	° W Lon	Source	Notes
Stump Spring	35.9834	115.8253	USGS Stump Spring 7.5' sheet; this report	Spring discharge after heavy snow years sufficient for traditional Southern Paiute farming practices into the 1930s, according to a tribe member.
Hidden Hills Ranch Spring	36.0147	115.8578	USGS Las Vegas 1:250,000 sheet (1954)	Remote imagery shows evidence of truck farming on arroyo floodplain adjacent to and downstream from a spring pool.
Browns Spring	36.0341	115.8882	Lundstrom et al., 2002	Area now heavily impacted by development
Unnamed spring mound	36.0344	115.8942	Lundstrom et al., 2002	Area now heavily impacted by development
Unnamed spring discharge area	36.0415	115.8976	Maxey and Jameson, 1948	Designated “bac” by Maxey and Jameson (1948).
Unnamed spring discharge area	36.0741	115.9395	This report; Maxey and Jameson 1948	Designated “5” by Maxey and Jameson (1948).
Monica Spring Mounds	36.0871	115.9124	This report; Maxey and Jameson, 1948	Designated “aab” by Maxey and Jameson (1948), these are two adjacent, well preserved spring mounds oriented N-S, located near the newly paved Monica Court.
Mound Spring	36.0991	115.9167	Lundstrom et al., 2002	Along with Stump and Browns Spring, one of the more extensive spring discharge areas in historic times.

The distribution of the springs generally overlaps the area here referred to as the Stateline fault system (Scheirer et al. (2010). The surface expression of the fault system consists of a series of subparallel scarps, coppices dune clusters, and exposed badland sediments that run northwest-southeast beginning about 0.025 miles east of the Nevada-California border (Figure DR48-1). Lundstrom and colleagues (2002) map the faults that divert groundwater to the near-surface environment as chiefly low-angle normal faults. Quade and colleagues (1995) describe these areas as a series of largely extinct groundwater discharge systems that represent the remnants of extensive, Pleistocene-age valley-bottom oases. The few springs that survived into the historic period are all that remained after post-Pleistocene desiccation and accompanying groundwater decline, which culminated in the current arid environment by about 8,000 B.P. (years before present).

Data Request

49. Please describe whether declining water levels attributable to project pumping would affect groundwater-dependent vegetation.

Response:Project pumping is not expected to have significant impacts on groundwater-dependent vegetation. Groundwater-dependent vegetation is perennial vegetation that must have access to groundwater for sufficient periods of time in order to survive. In the study area, there are two concentrations of groundwater-dependent vegetation: extensive mesquite (*P. glandulosa and P. pubescens*) thickets on coppice dunes and in arroyos along the Stateline fault system; and Salt cedar *(Tamarix aphylla*) thickets in the Charleston View area (Figure DR48-1).

Groundwater-dependent Vegetation in the Study Area

Mesquite is the most abundant groundwater-dependent vegetation in the study area. 6 Mesquite have deep root systems that can extend more than 100 ft below the surface. Quade et al. (1995) note that the mesquite trees of the Pahrump Valley “mark water depths of ~5-20m” (16 to 66 feet). The mesquite on coppice dunes and in arroyos along the Stateline fault system occur at a locally shallow water table. The shallow groundwater table is influenced by artesian flow created by the hydrologic barriers of individual faults (Quade et al., 1995; Lundstrom et al., 2002). Because the groundwater basin is a confined aquifer, precipitation and groundwater recharge in the Spring Mountains creates a higher potentiometric surface and head pressure that results in artesian flow and shallow water table along the Stateline fault system and at other spring complexes.

A reconnaissance-level review was conducted of the mesquite dune coppices and thickets along the Stateline fault system in Nevada. Tecopa Highway generally runs northwest/ southeast in this area. No appreciable die-back of mesquite coppice vegetation was noted on the dunes southeast of the Tecopa Highway (Figure DR49-1). Die-back of groundwater-dependent vegetation was found north and northwest of the Tecopa Highway, both on the dunes closer to the project area (Figure DR49-2); and in arroyos farther north and east, the latter describing the generally dendritic patterns seen in Figure DR48-1.

[6] Rare isolated mesquite can be found throughout the area except on the salt flats, but these solitary individuals, often in poor condition, do not represent groundwater-dependent vegetation.

Figure DR49-1. Relatively lush mesquite coppice dune vegetation south of the Tecopa Highway

Figure DR49-2. An area of recent die-back of a mesquite coppice on a dune face north of the Tecopa Highway

The only other area of groundwater-dependent vegetation identified in this study is the salt cedar thickets in the vicinity of the Charleston View development. Figure DR49-1 indicates a narrow corridor of groundwater-dependent vegetation along an arroyo downstream of Stump Spring that is maintained by shallow subsurface runoff from the spring.

The western portion of the study area, as well as the area south of Charleston View, is devoid of groundwater-dependent vegetation. Groundwater recharge is considerably less to the west and south in the comparatively low and relatively arid Nopah and Kingston Ranges, and the potentiometric surface is assumed to be deep compared to that of the aquifer extending west from the Spring Mountains.

Groundwater-dependent Vegetation and the Effect of Water Table Decline

The two areas of groundwater-dependent vegetation in the study area are associated with shallow groundwater conditions, and this vegetation has persisted despite general groundwater drawdown in the vicinity. Modeled groundwater table drawdown attributable to the project is 8 to 9 feet east and northeast of the project area along where groundwater-dependent vegetation occurs on dunes and 3 to 5 feet in the vicinity of Stump Springs and the groundwater-dependent vegetation there.

The effect of changing water table elevations needs to be considered in light of its potential natural variability. During years of heavy precipitation and greater groundwater recharge in the Spring Mountains there is consequent increased spring discharge and a higher potentiometric surface in the areas typified by artesian flow and a shallow water table. The nearly immediate response of spring discharge, although the recharge area is some 20 miles from the Stateline fault system, is due to the fact that the groundwater is within a confined aquifer, and changes in head pressure are transmitted quickly though the system. A corollary of this observation is that the mesquite, rooted in shallow groundwater as they are, must be adapted to appreciable interannual fluctuations in groundwater level. They would need to survive lowered groundwater conditions, potentially for years when there are a number of drought years in a row—not an infrequent occurrence in the desert. Observation suggests an interannual variability in groundwater depth of greater than 6 feet in the vicinity of Corn Creek Springs in the Upper Las Vegas Valley.

But while mesquite are adapted to some variability, including declines, in water table elevation, it also seems that historic die back of groundwater-dependent vegetation is likely due to long-term and persistent draw-down of the water table and decline of shallow groundwater influenced by artesian flow. The southernmost well reported by Cardno-Entrix (2011, after Buqo, 2004) displays a water table decline of approximately 40 ft during the middle and late 20th Century. Other wells reflect draw-downs of that magnitude. Draw-downs of less than 10 feet, on the other hand, may be within the tolerance of groundwater-dependent vegetation that has survived to the current time. Certainly draw-downs of less than five feet, which would encompass much of the study area, would be a negligible incremental addition to cumulative impacts of water table decline on groundwater-dependent vegetation. For these reasons, project pumping is not expected to have significant effects on groundwater-dependent vegetation.

Data Request

50. Please describe what monitoring and mitigation would be proposed if it is found groundwater-dependent vegetation could be significantly impacted.

Response: Because it is not expected that groundwater-dependent vegetation will be significantly impacted by project pumping, no monitoring or mitigation is proposed.

References (DRs 48-50)

Cardno-ENTRIX, 2011. Hidden Hills Project Interim Assessment Report (AFC Appendix 5.15D). Oakland, CA. July, 2011.

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Maxey, G.B. and C. H. Jameson. 1948. Geology and water resources of Las Vegas, Pahrump and Indian Springs Valleys, Clark and Nye Counties, Nevada. Nevada State Engineers Office Water Resources Bulletin 5. Carson City.

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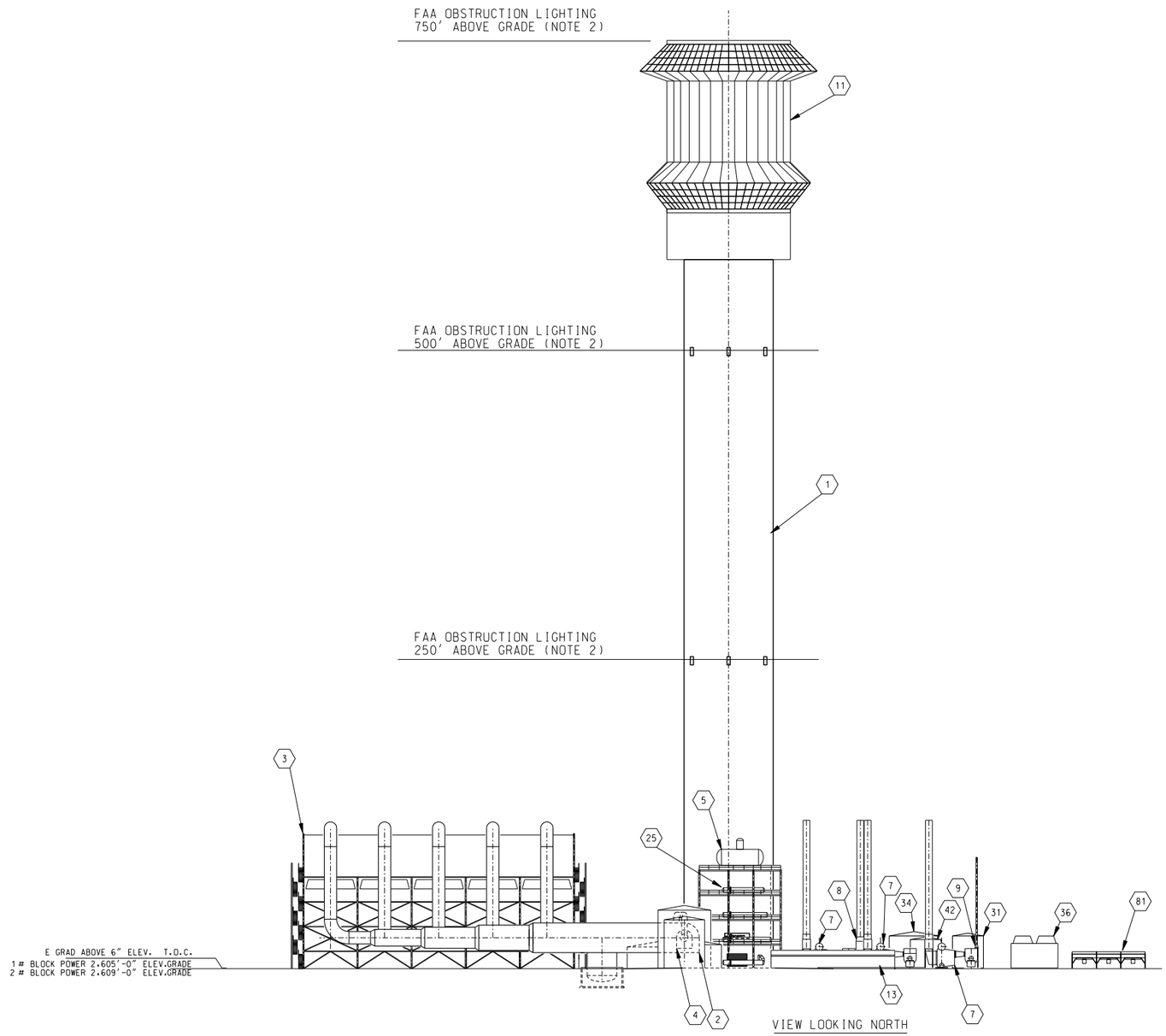
Scheirer, D. S., D. S. Sweetkind and J. J. Miller. 2010. Multiple phases of basin formation along the Stateline fault system in the Pahrump and Mesquite Valleys, Nevada and California. *Geosphere* 6(2): 93-129.

Figures



EQUIPMENT LEGEND

1	SOLAR POWER TOWER
2	STEAM TURBINE
3	AIR COOLED CONDENSER (ACC)
4	STEAM TURBINE GENERATOR
5	DEAERATOR
6	WASH VEHICLE FILLING AND FUELING STATION
7	HIGH PRESSURE AUXILARY BOILERS (3 REQ'D)
8	START-UP AUXILARY BOILER
9	NIGHT PRESERVATION AUXILARY BOILER (NPAB)
11	SOLAR RECEIVER STEAM GENERATOR (SRSG) ABOVE
13	PLANT SERVICES BUILDING
25	LP FEED WATER HEATERS (4 REQ'D)
31	DEMINERALIZED WATER STORAGE TANK
34	SERVICE / FIRE WATER STORAGE TANK
36	CCW WET SURFACE AIR COOLER (WSAC)
42	WASTE WATER STORAGE TANK
54	WASH WATER STORAGE TANK
81	FIN FAN COOLER

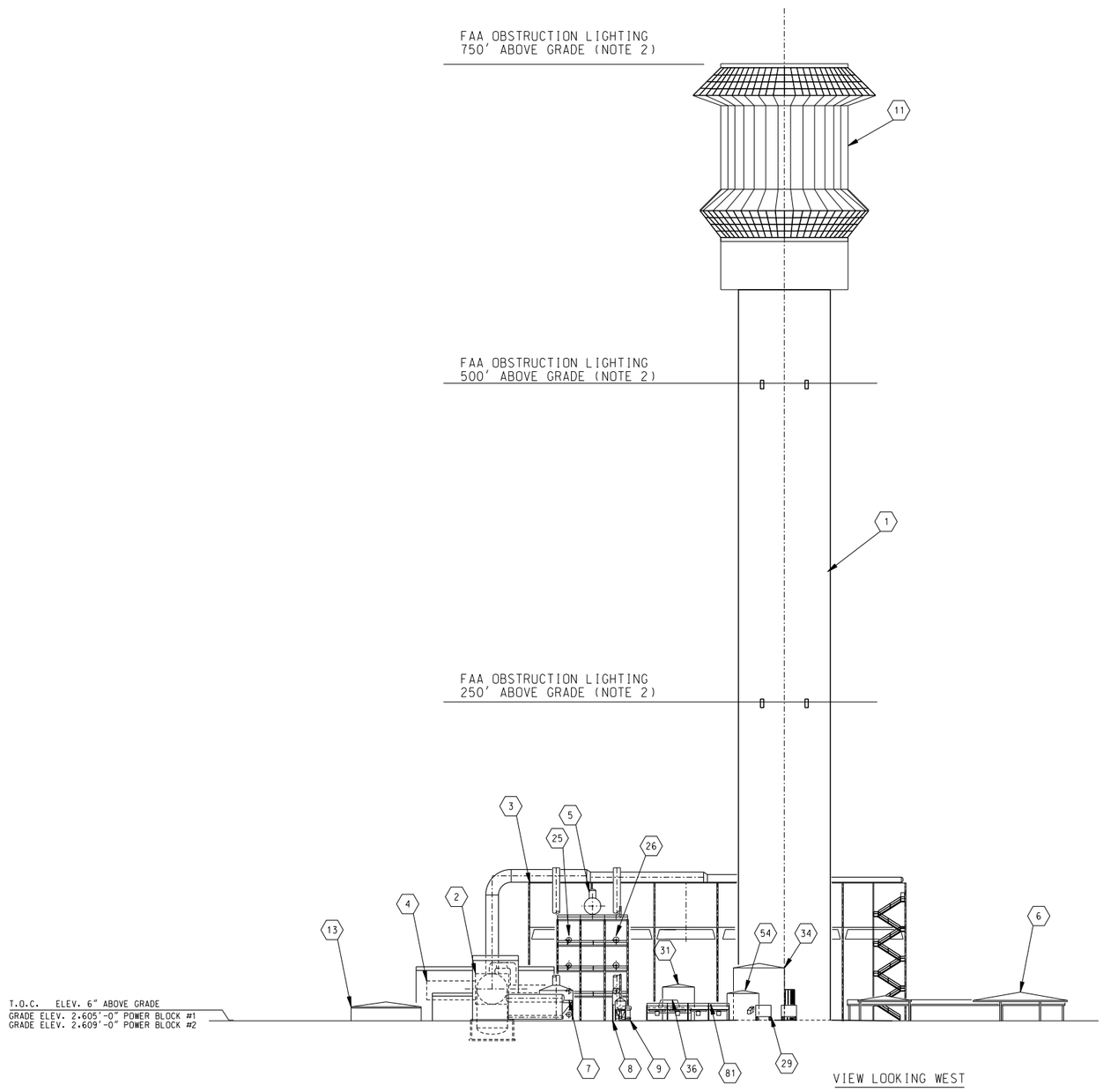
NOTES:

1. PLANT #2 SHOWN, PLANT #1 WILL BE SIMILAR EXCEPT ROADWORK
2. FAA OBSTRUCTION LIGHTING:
   MEDIUM INTENSITY FLASHING WHITE OBSTRUCTION LIGHT SYSTEM (MIWOL). SIX LIGHT UNITS PER LEVEL (0° NORTH, 60°, 120°, 180° SOUTH, 240°, 300°).

50 0 50 100
Scale: 1 INCH = 50 FEET

FIGURE 2.2-2aR1
Solar Plant 2, Elevation
Hidden Hills Solar Electric Generating System

Source: Drawing p1005 V8 rev3, 11/01/2011.



EQUIPMENT LEGEND

1	SOLAR POWER TOWER
2	STEAM TURBINE
3	AIR COOLED CONDENSER (ACC)
4	STEAM TURBINE GENERATOR
5	DEAERATOR
6	WASH VEHICLE FILLING AND FUELING STATION
7	HIGH PRESSURE AUXILARY BOILERS (3 REQ'D)
8	START-UP AUXILARY BOILER
9	NIGHT PRESERVATION AUXILARY BOILER (NPAB)
11	SOLAR RECEIVER STEAM GENERATOR (SRSG) ABOVE
13	PLANT SERVICES BUILDING
25	LP FEED WATER HEATERS (4 REQ'D)
26	HP BOILER FEED WATER HEATERS (3 REQ'D)
29	DEMINERALIZED WATER TRAILERS (2 REQ'D)
31	DEMIN. WATER STORAGE TANK
34	SERVICE / FIRE WATER STORAGE TANK
36	CCW WET SURFACE AIR COOLER (WSAC)
42	WASTE WATER STORAGE TANK
54	WASH WATER STORAGE TANK
81	FIN FAN COOLER

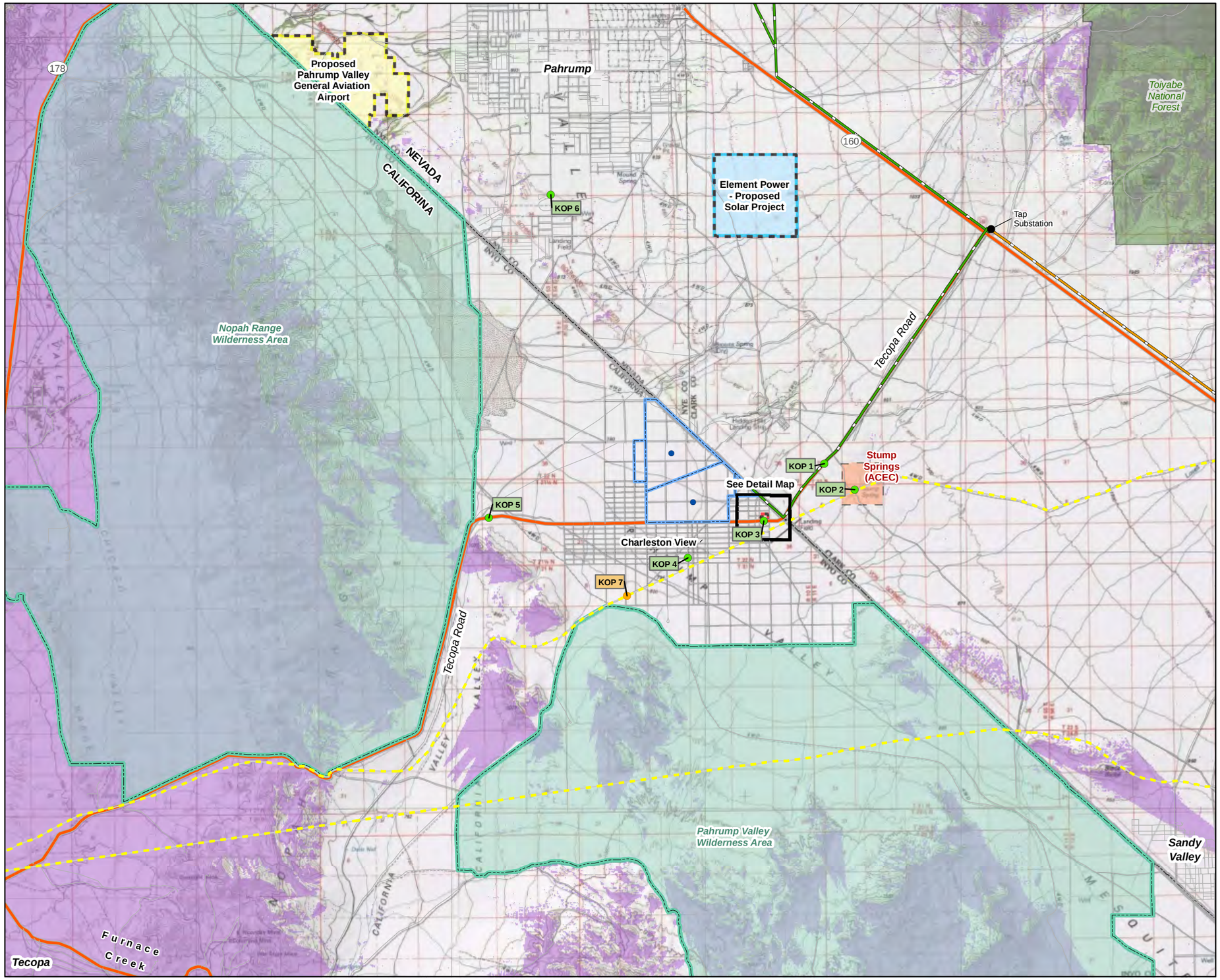
NOTES:

1. PLANT #2 SHOWN, PLANT #1 WILL BE SIMILAR EXCEPT ROADWORK
2. FAA OBSTRUCTION LIGHTING:
   MEDIUM INTENSITY FLASHING WHITE OBSTRUCTION LIGHT SYSTEM (MIWOL). SIX LIGHT UNITS PER LEVEL (0° NORTH, 60°, 120°, 180° SOUTH, 240°, 300°).

50 0 50 100
Scale: 1 INCH = 50 FEET

FIGURE 2.2-2bR1
Solar Plant 2, Elevation
Hidden Hills Solar Electric Generating System

Source: Drawing p1006 V8 rev3, 11/01/2011.



LEGEND

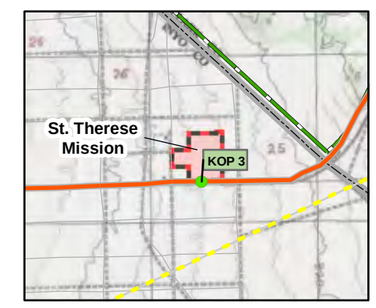
- HHSEGS Boundary
- Solar Power Tower
- Substation
- New Key Observation Point
- Existing Key Observation Point
- Old Spanish National Historic Trail
- BLM Areas of Critical Environmental Concern
- Wilderness Areas

Viewshed Analysis Results

- Not Visible - Line of Sight Blocked by Terrain
- Proposed 230kV Transmission Line
- Proposed 500kV Transmission Line
- State Boundary
- Major Road
- Local Road

Notes:
*Old Spanish National Historic Trail alignment obtained from the National Historic Trails department of the National Park Service. Data accuracy is based on a scale of 1:100,000 or smaller.

Detail Map



N

0 1 2 3
Miles

Figure DR 32-1
Location of New Key Observation Point
Hidden Hills Solar Electric Generating System

CH2MHILL

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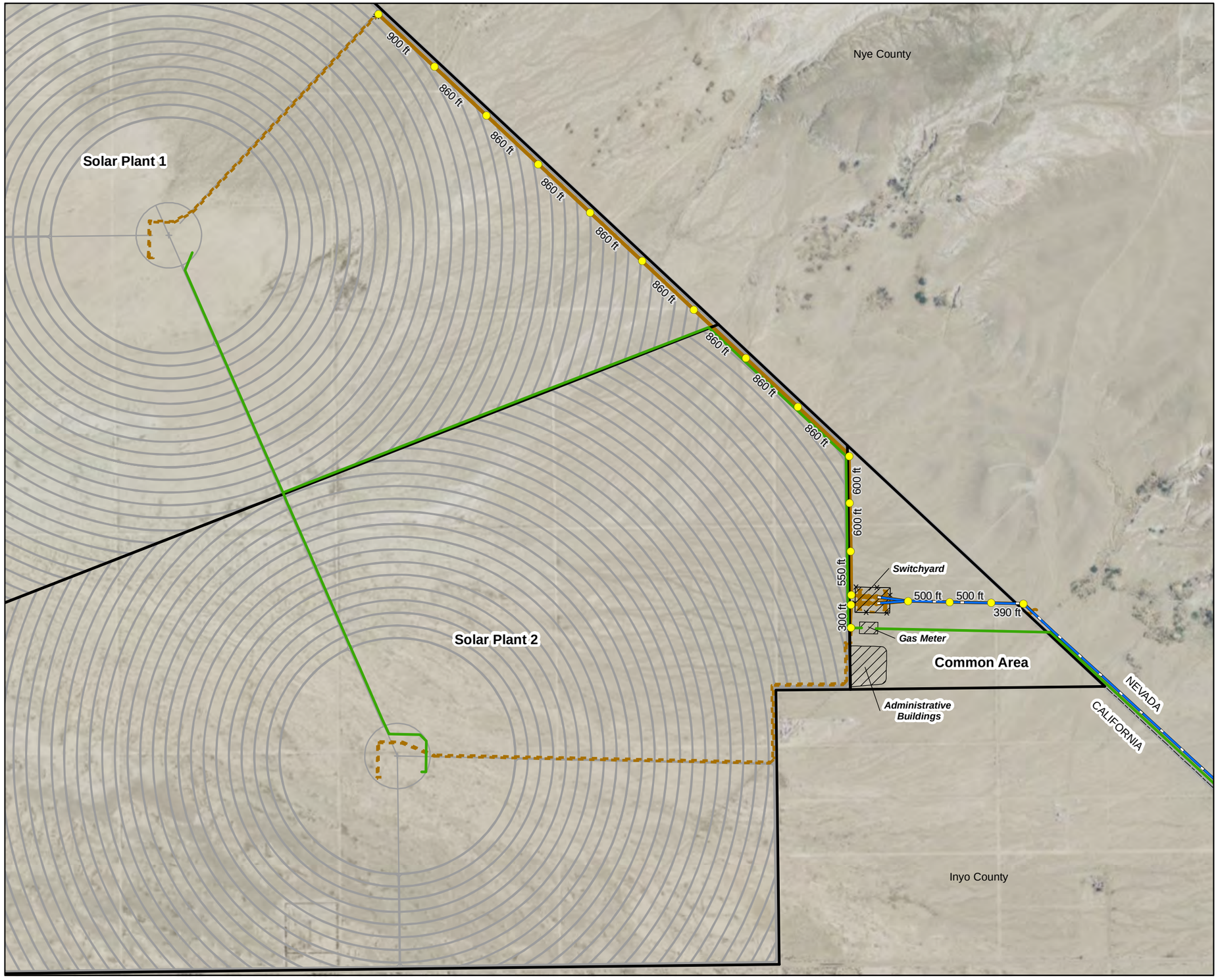
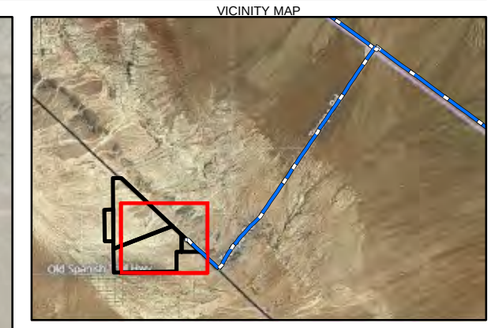
A. KOP-7: Existing view toward the project site from Garnet Road, 1.75 miles south of Tecopa Road.

B. KOP-7: Simulated view toward the project site from Garnet Road, 1.75 miles south of Tecopa Road.

FIGURE **DR 32-2**
KOP-7. View from Garnet Road
Hidden Hills SEGS
Inyo County, California

CH2MHILL®





LEGEND

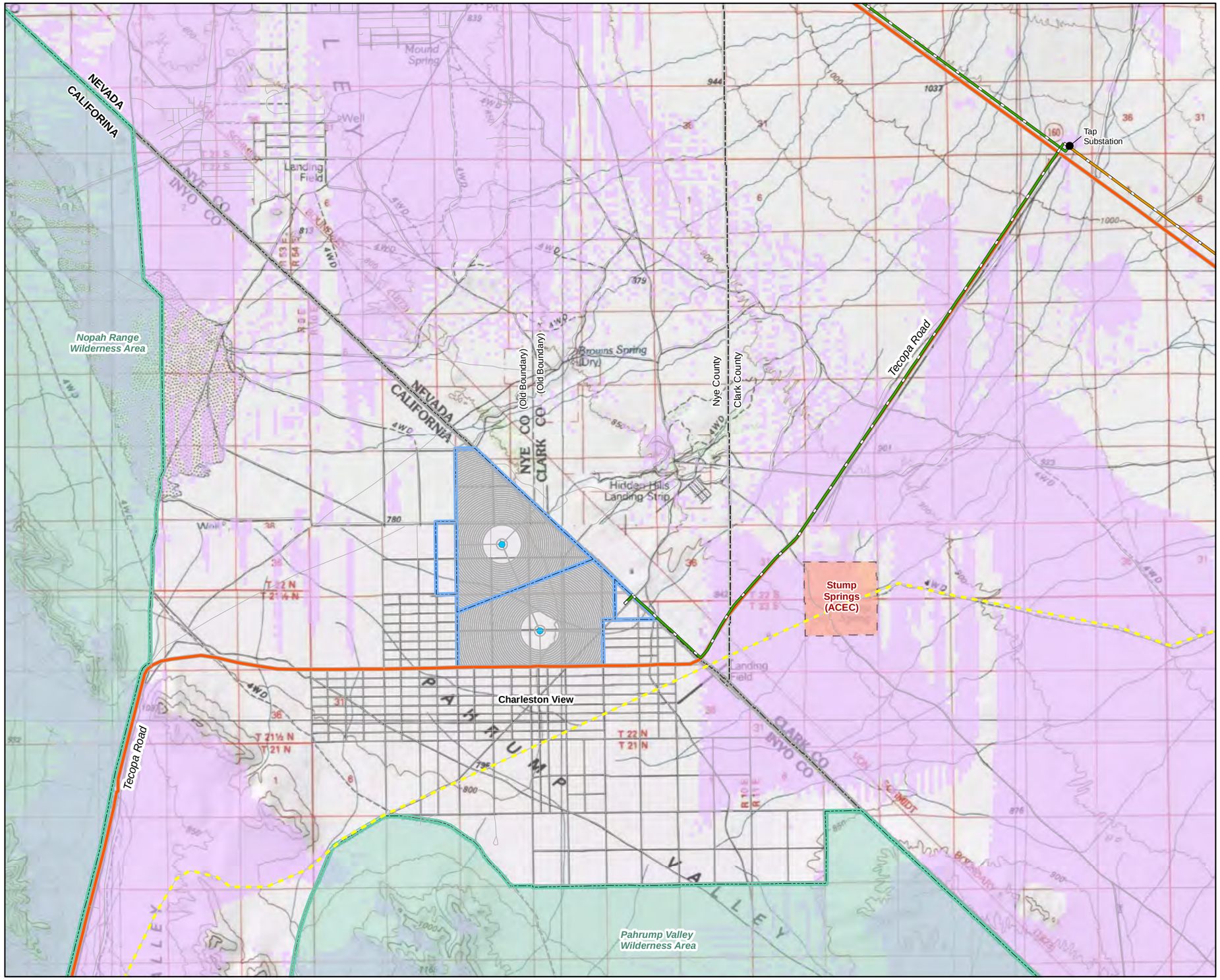
- Transmission Pole
- Transmission Line Corridor
- Transmission Line
- Underground Transmission Line
- Gasline
- Solar Field Arrays
- Site Features
- Project Boundary

Note:
Distances should be considered approximate

N

0 600 1,200
Feet

Figure DR34-1
Approximate Transmission Pole Placement
Hidden Hills Solar Electric Generating System



LEGEND

- Substation
- Solar Power Tower
- Areas Occupied by Heliostat Arrays
- Old Spanish National Historic Trail
- Proposed 230kV Transmission Line
- Proposed 500kV Transmission Line
- State Boundary
- Major Road
- Local Road
- HHSEGS Boundary
- BLM Areas of Critical Environmental Concern

Viewshed**

- Not Visible
- Visible

Notes:
*Old Spanish National Historic Trail alignment obtained from the National Historic Trails department of the National Park Service. Data accuracy is based on a scale of 1:100,000 or smaller.

**This viewshed analysis depicts the potential visibility of the heliostat arrays and reflects a heliostat height of 12 feet

N

0 1 2
Miles

Figure DR37-1
Potential Visibility of Heliostats
Hidden Hills Solar Electric Generating System

CH2MHILL

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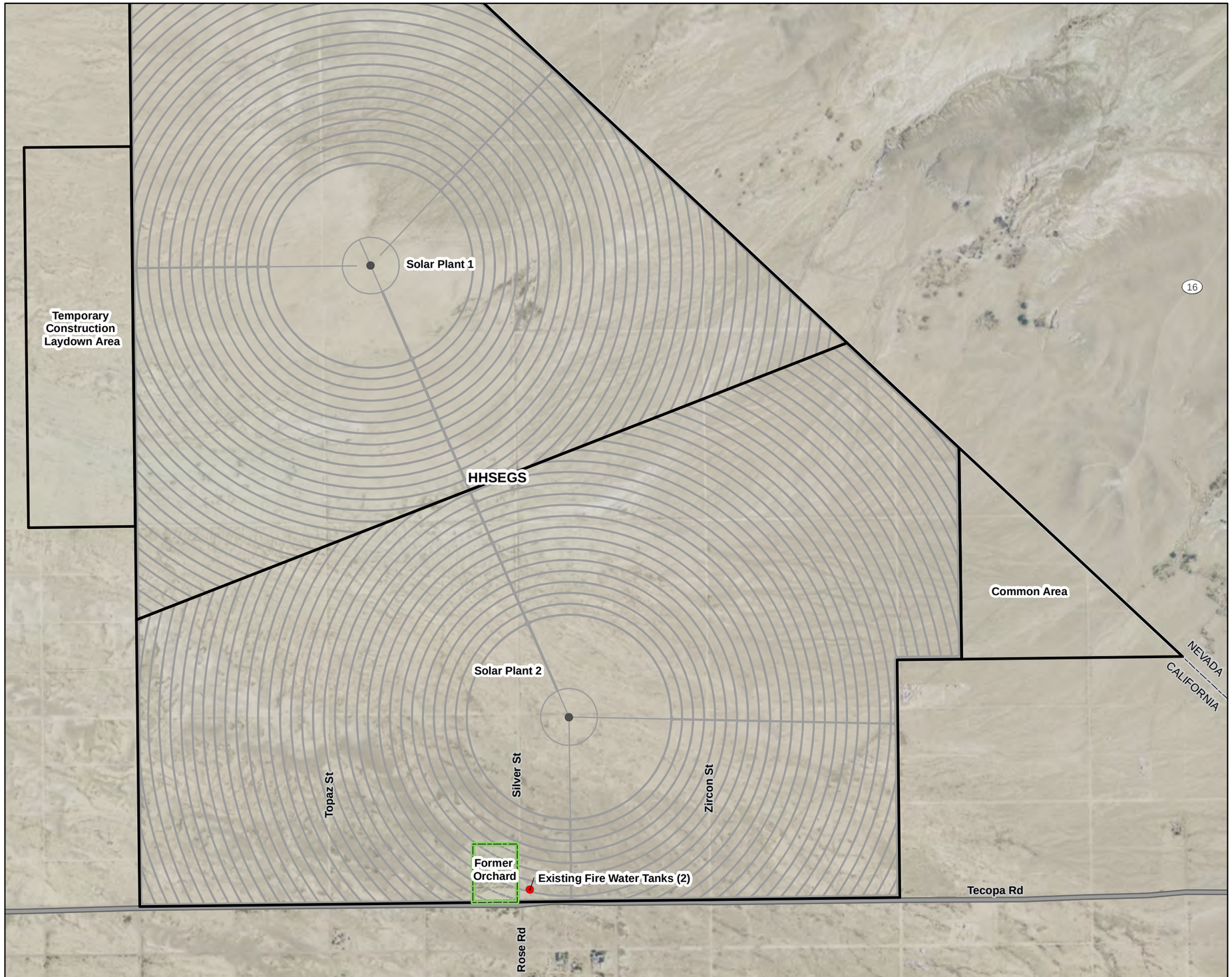

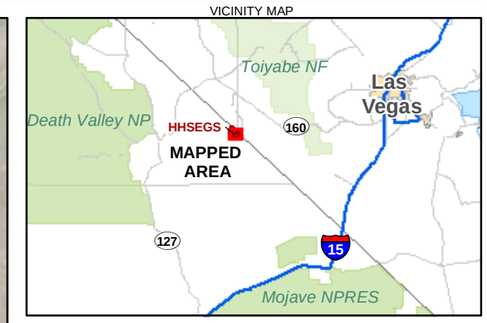

LEGEND

- Existing Fire Water Tanks
- Solar Towers
- Solar Field Heliostat Arrays
- Former Orchard
- Project Boundary

N

0 700 1,400
Feet

FIGURE DR38-1
Orchard Location Map
Hidden Hills Solar Electric Generating System

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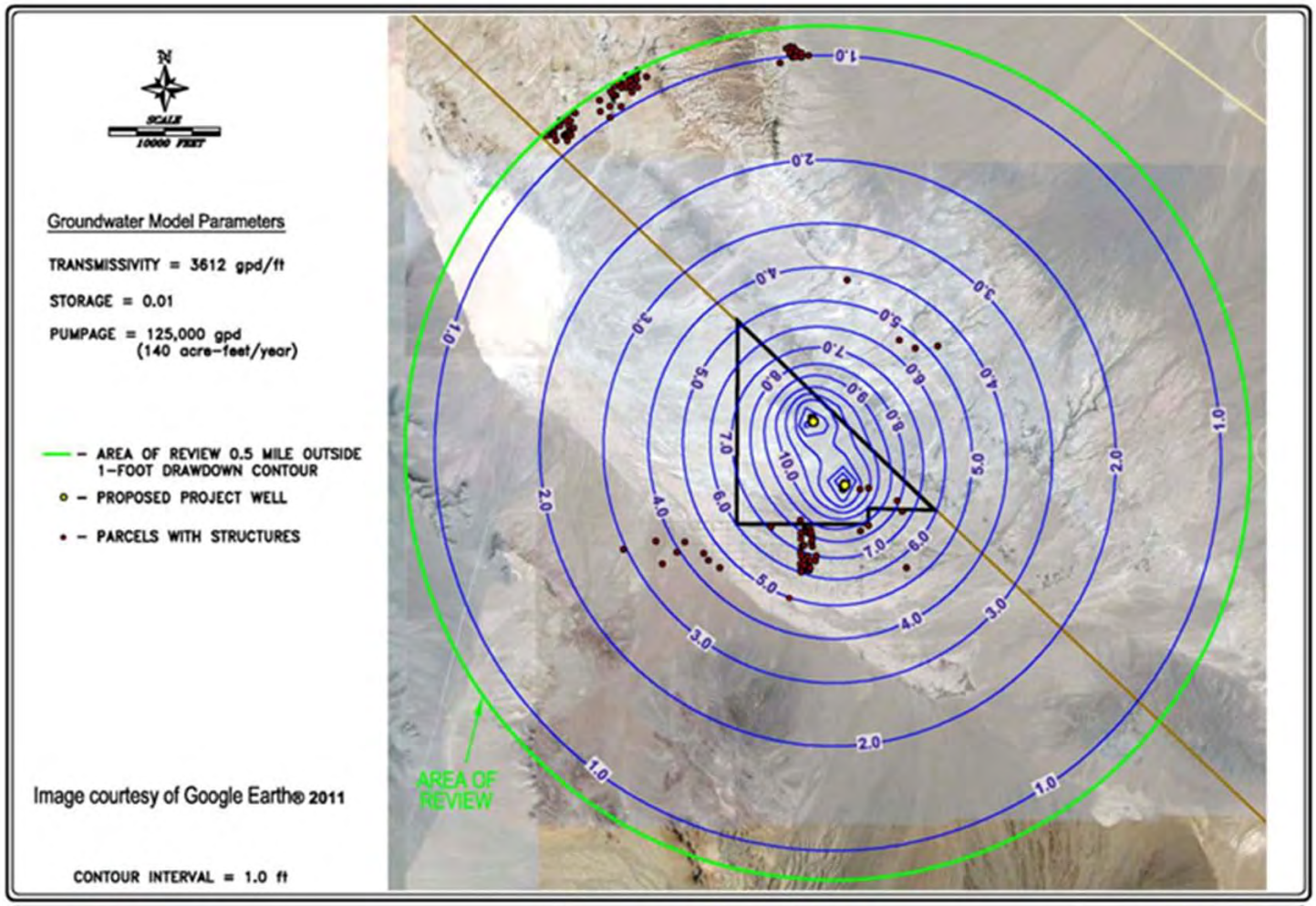
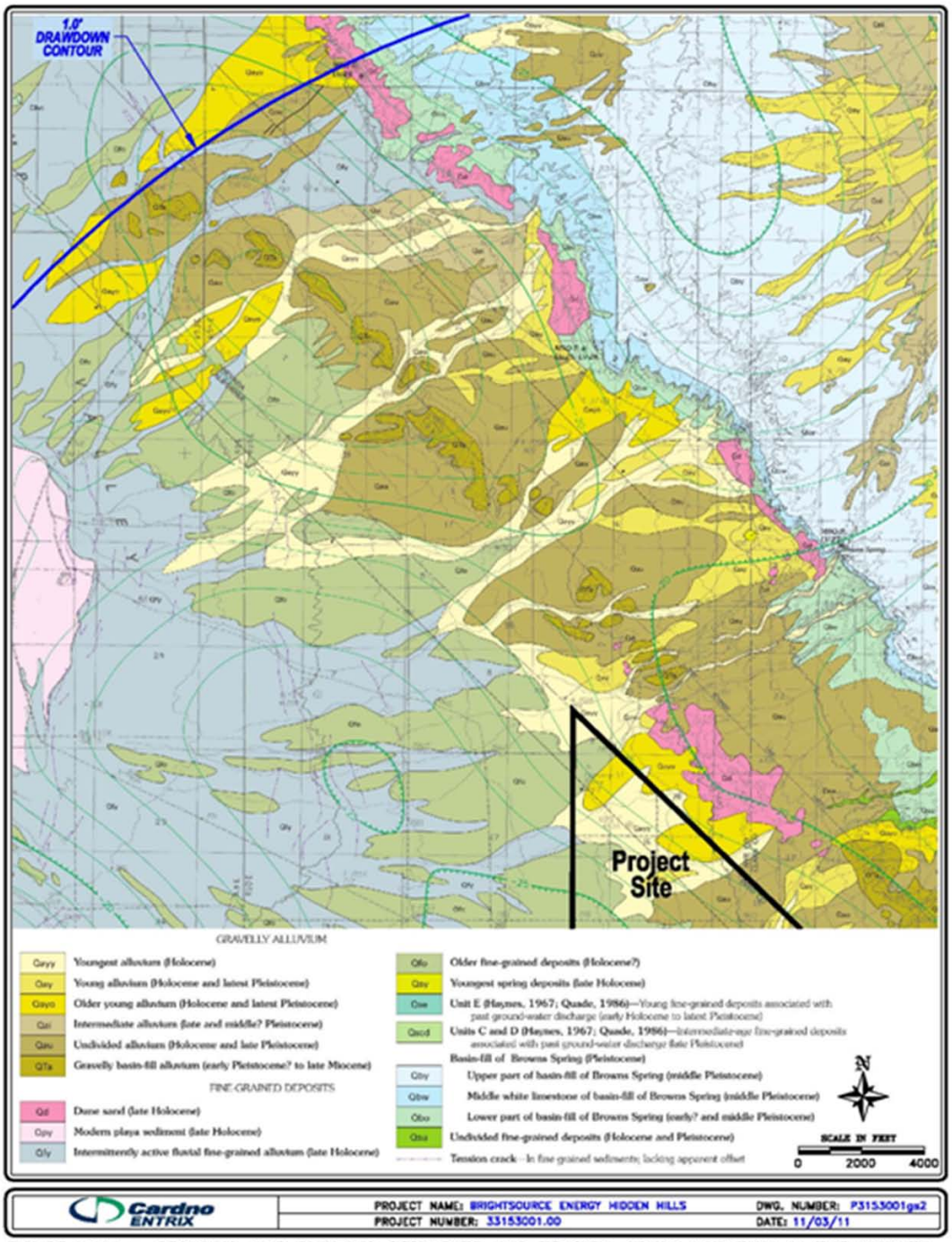


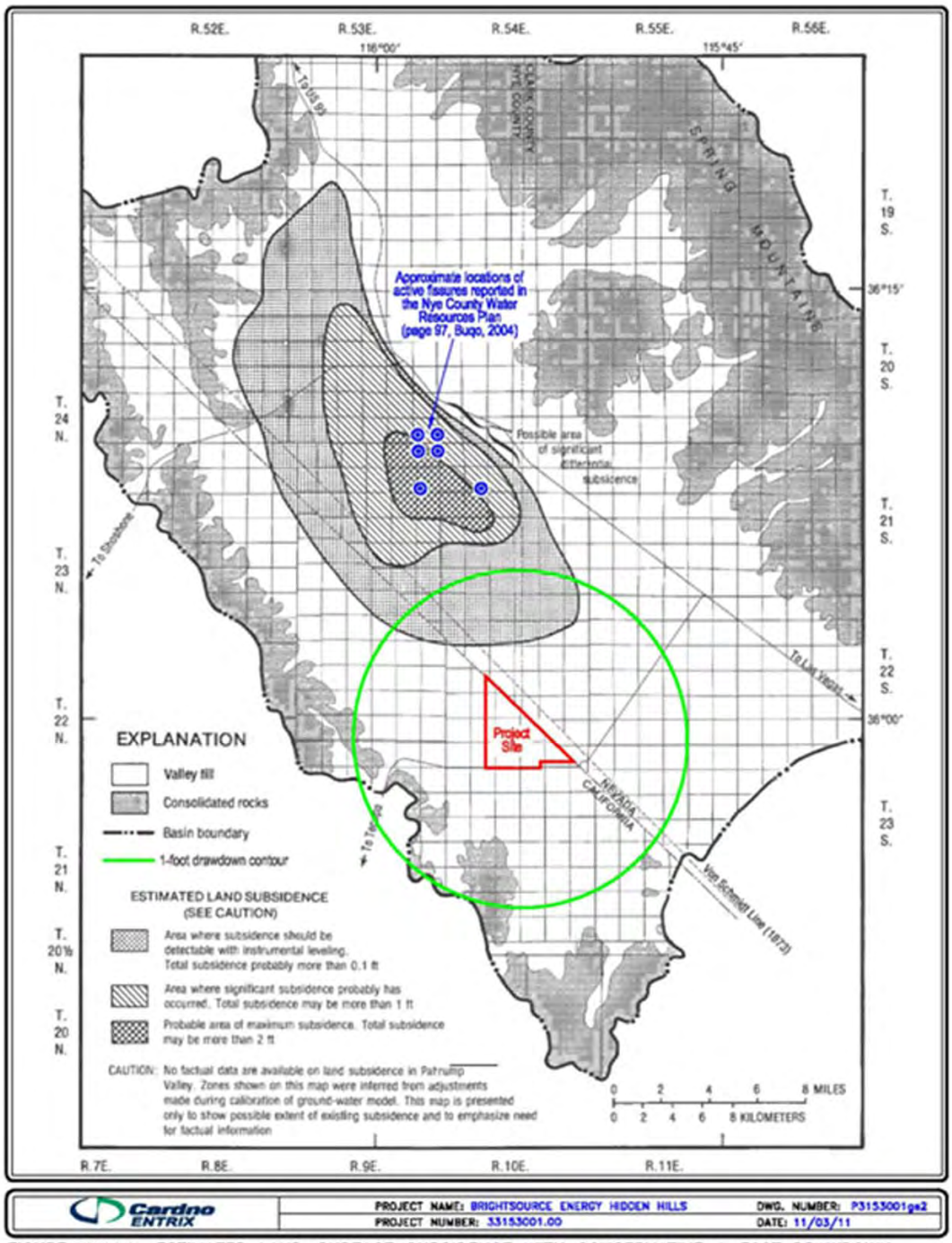
Cardno ENTRIX	PROJECT NAME: BRIGHTSOURCE ENERGY HIDDEN HILLS PROJECT NUMBER: 33153001.00	DWG. NUMBER: P3153001ga2 DATE: 11/01/11

FIGURE DR43-1. MAP SHOWING APPROXIMATE LOCATION OF STRUCTURES / POTENTIAL STRUCTURES.



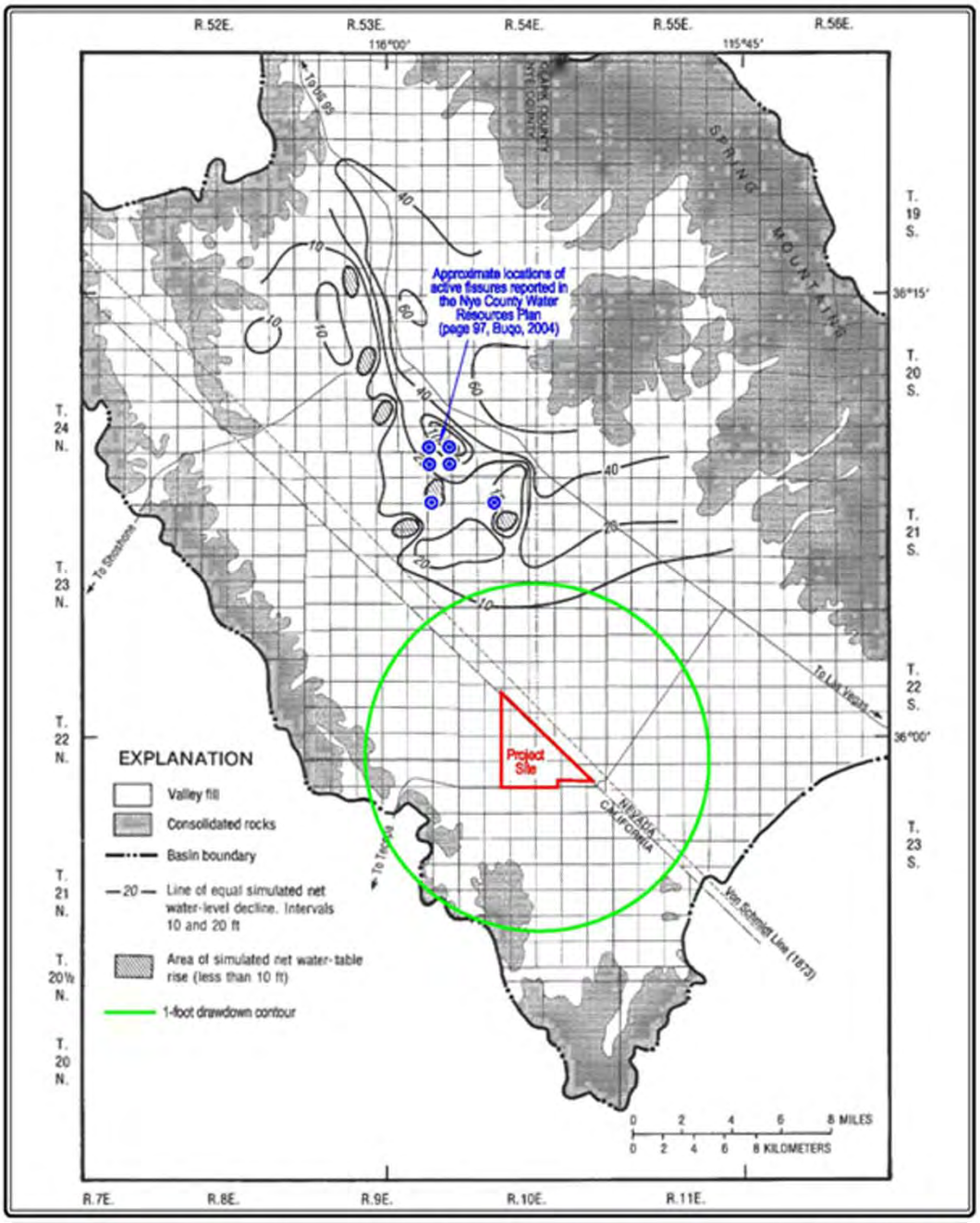
Cardno ENTRIX	PROJECT NAME: BRIGHTSOURCE ENERGY HIDDEN HILLS	DWG. NUMBER: P3153001gx2
	PROJECT NUMBER: 33153001.00	DATE: 11/03/11

FIGURE DR44-1. GEOLOGIC MAP SHOWING SEDIMENTS AND TENSION CRACK LOCATION IN THE VICINITY OF THE SITE. (MODIFIED FROM LUNDSTROM, ET AL., 2002)



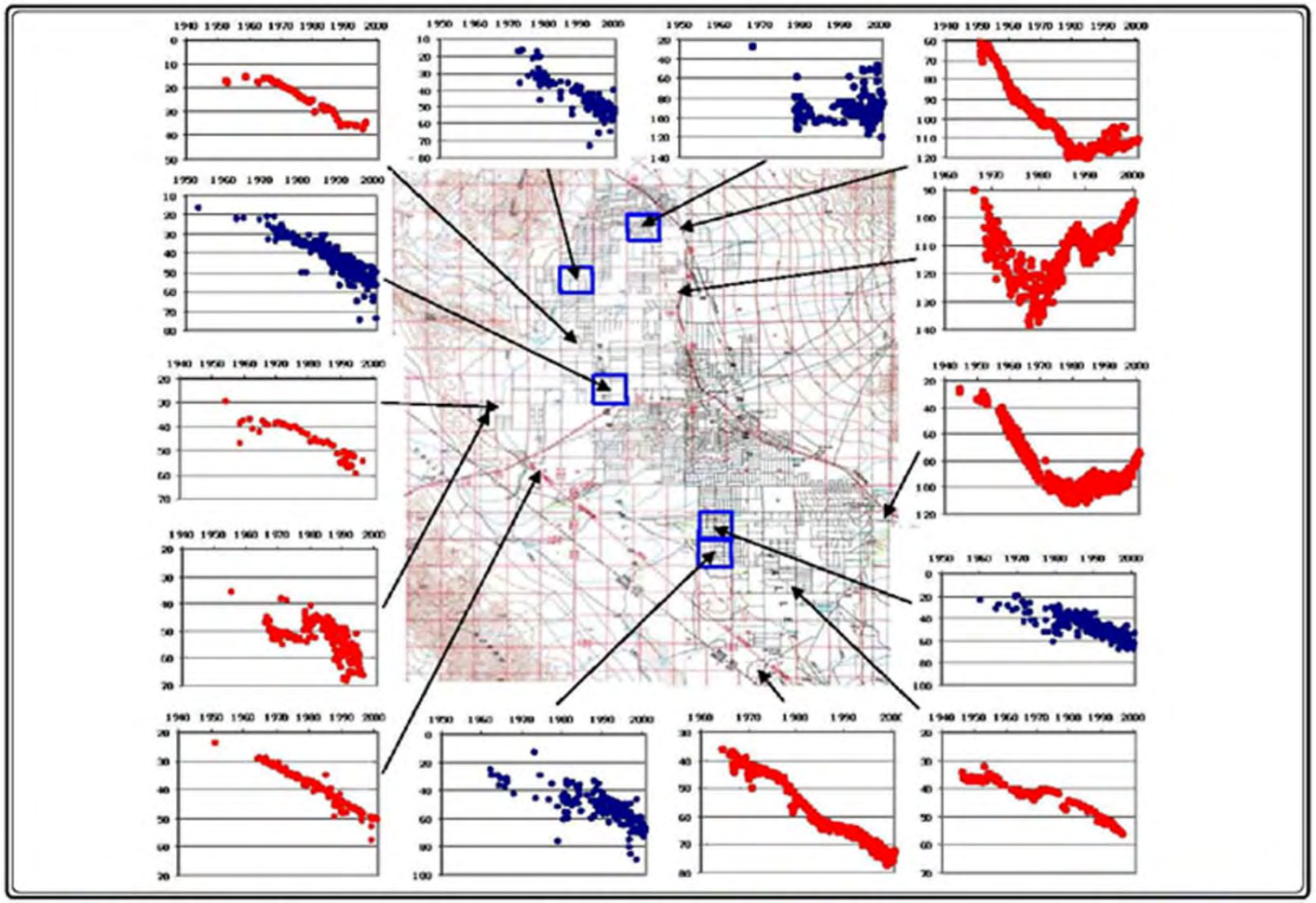
Cardno ENTRIX	PROJECT NAME: BRIGHTSOURCE ENERGY HIDDEN HILLS	DWG. NUMBER: P3153001ga2
	PROJECT NUMBER: 33153001.00	DATE: 11/03/11

FIGURE DR44-2. ESTIMATED LAND-SURFACE SUBSIDENCE WITH CONSERVATIVE 1-FOOT DRAWDOWN CONTOUR OVERLAY FROM SIMULATED SITE PUMPAGE. (MODIFIED FROM "GROUND-WATER STORAGE DEPLETION, PAHRUMP VALLEY, NEV.-CALIF., 1962-75" BY JAMES R. HARRILL)



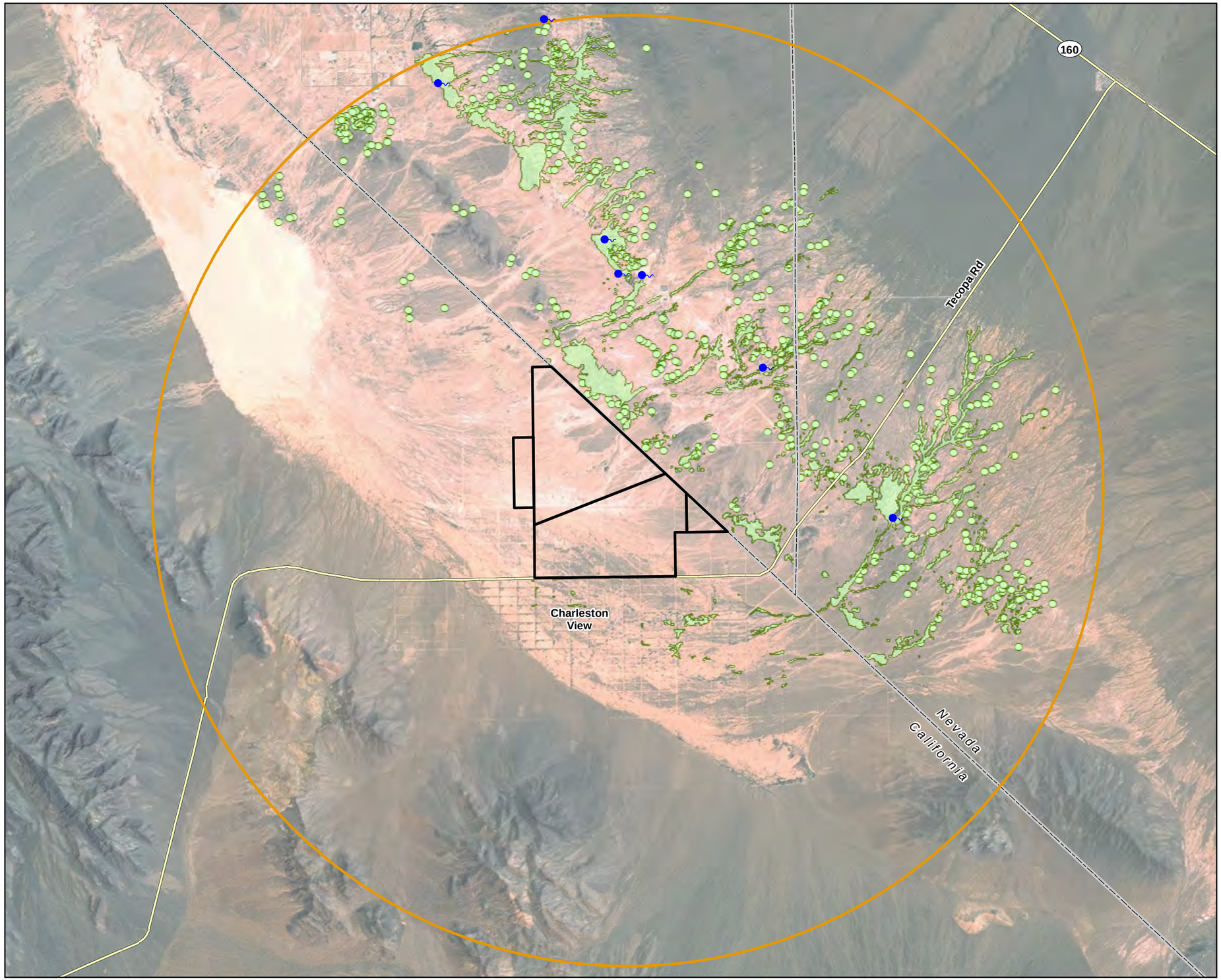
Cardno ENTRIX	PROJECT NAME: BRIGHTSOURCE ENERGY HIDDEN HILLS	DWG. NUMBER: P3153001ge2
	PROJECT NUMBER: 33153001.00	DATE: 11/03/11

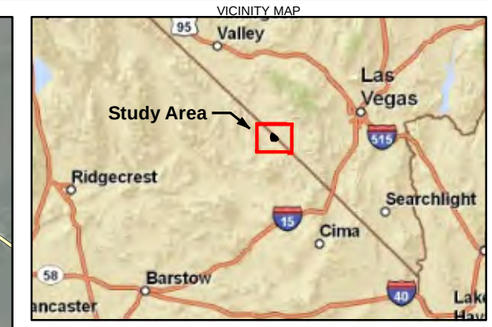
FIGURE DR44-3. SIMULATED NET CHANGES IN THE WATER TABLE (FEBRUARY 1913 – FEBRUARY 1976) WITH CONSERVATIVE 1-FOOT DRAWDOWN CONTOUR OVERLAY FROM SIMULATED SITE PUMPAGE. (MODIFIED FROM "GROUND-WATER STORAGE DEPLETION, PAHRUMP VALLEY, NEV.-CALIF., 1962-75" BY JAMES R. HARRILL)



Cardno ENTRIX	PROJECT NAME: BRIGHTSOURCE ENERGY HIDDEN HILLS PROJECT NUMBER: 33153001.00	DWG. NUMBER: P3153001ge2 DATE: 11/03/11

FIGURE DR44-4. LONG-TERM WATER LEVEL TRENDS IN PAHRUMP VALLEY. (MODIFIED FROM "NYE COUNTY WATER RESOURCES PLAN" BUQO 2004)





LEGEND

- Recorded Springs/Recent Spring Mounds
- Project Boundary
- Study Area
- County Boundary
- Groundwater Dependent Vegetation

N

0 0.75 1.5
Miles

FIGURE DR48-1
Groundwater Dependent Vegetation in the Study Area
Hidden Hills SEGS

CH2MHILL

SAC \\ZION\SACGIS\PROJ\SOLARPROJECTS\HIDDENHILLS\MAPFILES\2011_HIDDENHILLS\HIDDENHILLS_GWDEPENDENTVEGETATION.MXD SSCOPES 11/16/2011 2:04:48 PM

Attachment DR2-1
Agency Correspondence Regarding Air Emission Sources in Project Vicinity

May 24, 2011

sierra research

1801 J Street
Sacramento, CA 95811
Tel: (916) 444-6666
Fax: (916) 444-8373

Ann Arbor, MI
Tel: (734) 761-6666
Fax: (734) 761-6755

Mr. Theodore Schade
Great Basin Unified Air Pollution Control District
157 Short Street
Bishop, CA 93514-3537

Re: Cumulative Impacts Analysis
BrightSource Energy Hidden Hills Ranch Solar Electric Generating Station

Dear Mr. Schade:

BrightSource Energy (BSE) will be submitting an application for a Determination of Compliance to the District and an Application for Certification to the California Energy Commission for the Hidden Hills Ranch Solar Electric Generating Station (HHR SEGS) in July of this year. BSE is proposing to construct a 500 MW solar thermal power plant in southern Inyo County between Tecopa and the state line. A map showing the location of the proposed project is attached. As part of the project review, the CEC requires BSE to prepare an analysis of the project's cumulative air quality impacts. This is defined by the CEC as "a cumulative air quality modeling impacts analysis of the project's typical operating mode in combination with other stationary source emissions sources **within a six-mile radius** *which have received construction permits but are not yet operating, or are in the permitting process.*" [Emphasis added.] We have interpreted this as follows:

- Projects for which permits to construct have been issued since January 1, 2010; and
- Projects for which permits to construct have not been issued, but are reasonably foreseeable.

We would like to obtain from the District a list of projects within six miles of the new power plant location for which permits to construct have been issued since January 1, 2010, and for which permits to construct have not been issued, but are reasonably foreseeable, along with sufficient emissions information and stack parameters so that we can include these sources in our air quality modeling. Facilities that meet these criteria but emit only VOCs can be excluded.

Thank you very much for your assistance. If you have any questions regarding the information we are requesting, feel free to call.

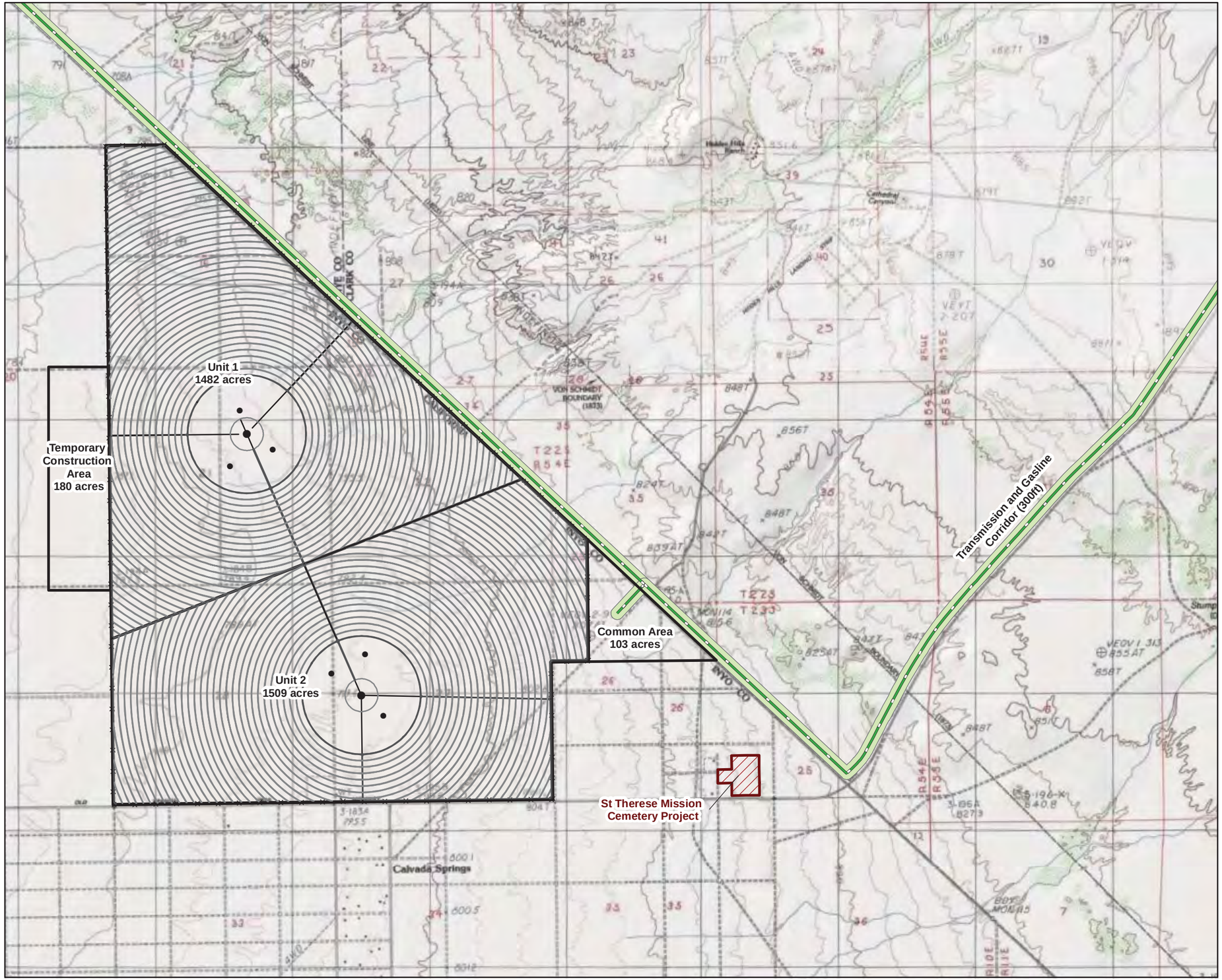
Sincerely,

Nancy Matthews

Nancy Matthews

Attachment

cc: Clay Jensen, BrightSource Energy
Susan Strachan, Strachan Consulting



VICINITY MAP

LEGEND

- Solar Towers
- Solar Field Points
- Project Site Fence
- Solar Field Paths
- Access Roads
- Survey Corridor (300ft)
- Survey Corridor (300ft)
- St Therese Mission Cemetery Project
- Project Boundary

Notes:
1. Area of interest subject to change.

DRAFT

N

0 1,200 2,400
Feet

Figure 1
Hidden Hills Site and Propsed Transmission Lines
Hidden Hills

SAC \\ZION\SACGIS\PROJ\SOLARPROJECTS\HIDDENHILLS\MAPFILES\2011_HIDDENHILLS\HIDDENHILLS_SITE.PDF.MXD SSCOPES 4/13/2011 4:20:48 PM

CH2MHILL

Nancy L. Matthews

From: Jan Sudomier <Jan@gbuapcd.org>
Sent: Thursday, June 09, 2011 8:35 AM
To: Nancy L. Matthews
Subject: RE: BrightSource Energy Hidden Hills Ranch-- cumulative impacts information

There are no facilities in the District, other than the St. Therese project, within 6 miles of the perimeter of the Hidden Hills Ranch project

---

From: Nancy L. Matthews [mailto:NMatthews@sierraresearch.com]
Sent: Wednesday, June 08, 2011 5:09 PM
To: Jan Sudomier
Cc: Nancy L. Matthews
Subject: FW: BrightSource Energy Hidden Hills Ranch-- cumulative impacts information

Jan-- Were you able to determine whether there are any sources (other than St Therese) in the District that would meet these criteria?

Thank you--

Nancy

From: Ted Schade [mailto:tschade@gbuapcd.org]
Sent: Tuesday, May 24, 2011 4:21 PM
To: Nancy L. Matthews
Subject: Re: BrightSource Energy Hidden Hills Ranch-- cumulative impacts information

Duane - please assist. I would imagine we have no cumulative sources in this area.

Ted

On May 24, 2011, at 4:00 PM, "Nancy L. Matthews" <NMatthews@sierraresearch.com> wrote:

> Hello, Ted—
>
> Attached please find a request for information regarding potential sources of emissions in the vicinity of BrightSource Energy's proposed Hidden Hills Ranch solar power plant project site. If you have any questions regarding this information request, please feel free to call.
>
> Thank you for your assistance--
>
> Nancy Matthews
>
> Sierra Research

1801 J Street

Sacramento, CA 95811

nmatthews@sierraresearch.com

916-273-5124 (direct)

916-444-6666 (main)

916-444-8373 (fax)

<GBV cumulative info 052411.pdf>

sierra
research

1801 J Street
Sacramento, CA 95811
Tel: (916) 444-6666
Fax: (916) 444-8373

Ann Arbor, MI
Tel: (734) 761-6666
Fax: (734) 761-6755

June 2, 2011

Mr. Larry Kennedy
State of Nevada, Division of Environmental Protection
Bureau of Air Pollution Control
901 So. Stewart St., Suite 4001
Carson City, NV 89701

Re: Cumulative Impacts Analysis
BrightSource Energy Hidden Hills Solar Electric Generating Facility

Dear Mr. Kennedy:

BrightSource Energy (BSE) is proposing to construct a 500 MW solar thermal power plant in southern Inyo County, California, along the California-Nevada state line. A map showing the location of the proposed project is attached. BSE will be submitting an application for a Determination of Compliance to the Great Basin Unified Air Pollution Control District and an Application for Certification to the California Energy Commission for the Hidden Hills Solar Electric Generation Facility in July of this year. As part of the project review, the CEC requires BSE to prepare an analysis of the project's cumulative air quality impacts. This is defined by the CEC as "a cumulative air quality modeling impacts analysis of the project's typical operating mode in combination with other stationary source emissions sources **within a six-mile radius** *which have received construction permits but are not yet operating, or are in the permitting process*." [Emphasis added.] We have interpreted this as follows:

- Projects for which permits to construct have been issued since January 1, 2010; and
- Projects for which permits to construct have not been issued, but are reasonably foreseeable.

We would like to obtain from BAPC a list of projects within your jurisdiction located within six miles of the new power plant location for which permits to construct have been issued since January 1, 2010, and for which permits to construct have not been issued, but are reasonably foreseeable, along with sufficient emissions information and stack parameters so that we can include these sources in our air quality modeling. Facilities that meet these criteria but emit only VOCs can be excluded.

Thank you very much for your assistance. If you have any questions regarding the information we are requesting, feel free to call.

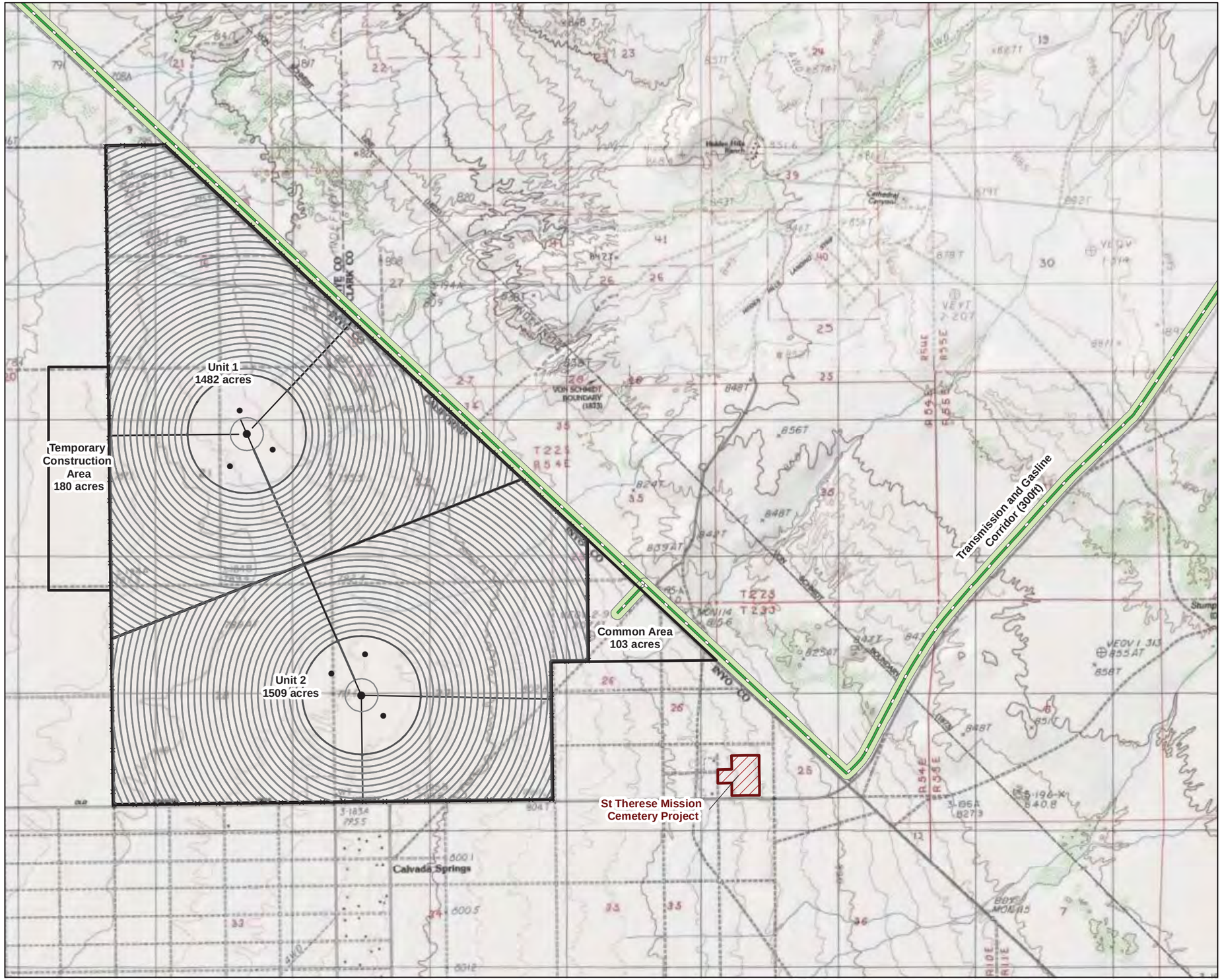
Sincerely,

Nancy Matthews

Nancy Matthews

Attachment

cc: Clay Jensen, BrightSource Energy
Susan Strachan, Strachan Consulting
Jan Sudomier, GBUAPCD



VICINITY MAP

LEGEND

- Solar Towers
- Solar Field Points
- Project Site Fence
- Solar Field Paths
- Access Roads
- Survey Corridor (300ft)
- Survey Corridor (300ft)
- St Therese Mission Cemetery Project
- Project Boundary

Notes:
1. Area of interest subject to change.

DRAFT

N

0 1,200 2,400
Feet

Figure 1
Hidden Hills Site and Propsed Transmission Lines
Hidden Hills

SAC \\ZION\SACGIS\PROJ\SOLARPROJECTS\HIDDENHILLS\MAPFILES\2011_HIDDENHILLS\HIDDENHILLS_SITE.PDF.MXD SSCOPES 4/13/2011 4:20:48 PM

CH2MHILL

Nancy L. Matthews

From: larry kennedy <lakenned@ndep.nv.gov>
Sent: Monday, July 11, 2011 9:24 AM
To: Nancy L. Matthews; Jan Sudomier
Subject: RE: Pahrump Area Query - solar thermal project in Inyo Co
Attachments: Sierra Research Query.xlsx; solar thermal project for southern Inyo County, CA

Jan & Nancy, pls let us know if you have any questions. Unfortunately we're having some issues with our GIS & couldn't do a simply geographic query.

Larry

From: Patrick Anderson
Sent: Tuesday, July 05, 2011 11:26 AM
To: 'nmatthews@sierraresearch.com'
Cc: larry kennedy
Subject: Pahrump Area Query - solar thermal project

Attached is a list of active permits in the Pahrump Valley Hydrographic Basin #162. If any of these interest you in greater detail, let me know and I will attempt to answer your questions. For clarification, a SAD is a Surface Area Disturbance permit for dust control; a Class 2 is a stationary minor source; and a Class 3 is a stationary minor source subject to a facility-wide 5 tpy cumulative emissions cap for all pollutants. Hope this helps – good luck!

FIN	Fac. Seq.	Company Name	Issue Date	Class	Facility ID	Facility Name	Basin	Section	Township	North/South	Range	County
A0475	0519	WULFENSTEIN CONSTRUCTION CO, INC	7/9/06	2	AP16110519.02	CLASS 2 - BLM PIT	162	29	20	S	54E	NY
A0181	0890	JOE'S HAULING, LLC	7/7/09	2	AP14420890.02	SAD -AVE OF THE STARS & SR160, PAHRUMP	162	35	19	S	53E	NY
A0205	0923	WULFCO, LLC	1/26/10	2	AP16290923.02	SAD - WULFENSTEIN COMM. DEV PROJECT	162	33	20	S	54E	NY
A0216	1085	WULFENSTEIN CONSTRUCTION CO, INC	1/20/11	2	AP16291085.02	SAD -BLM PIT, 3 MI. S. OF PAHRUMP	162	29	20	S	54E	NY
A0098	1094	ERLANDSON TRANSPORTATION, INC.	7/20/06	3	AP14421094.01	CLASS 3	162	29	20	S	54E	NY
A0226	1135	NYE CTY DEPT OF PUBLIC WORKS	8/23/06	2	AP49531135.01	SAD -PAHRUMP LANDFILL	162	02	20	S	53E	NY
A0235	1171	WULFENSTEIN CONSTRUCTION CO, INC	12/21/06	2	AP14421171.01	SAD -INDUSTRIAL PIT	162	24	20	S	53E	NY
A0236	1172	WULFENSTEIN CONSTRUCTION CO, INC	12/21/06	2	AP14421172.01	SAD -NORTH PAHRUMP PIT	162	05	19	S	53E	NY
A0237	1173	WULFENSTEIN CONSTRUCTION CO, INC	12/21/06	2	AP14421173.01	SAD -BELL VISTA PIT	162	25	19	S	53E	NY
A0238	1174	WULFENSTEIN CONSTRUCTION CO, INC	12/21/06	2	AP14421174.01	SAD -GAMEBIRD PIT	162	03	21	S	54E	NY
A0240	1180	NYE CTY. DEPT. OF PUBLIC WORKS	1/31/07	2	AP16291180.01	SAD -BASIN PIT	162	18	20	S	54E	NY
A0241	1181	NYE CTY. DEPT. OF PUBLIC WORKS	1/31/07	2	AP16291181.01	SAD -WHEELER PASS PIT	162	28	20	S	54E	NY
A0249	1213	WULFENSTEIN CONSTRUCTION CO, INC	5/21/07	2	AP16291213.01	SAD -CHARLESTON RV PARK	162	24	20	S	53E	NY
A0264	1256	MOUNTAIN FALLS, LLC	10/31/07	2	AP16291256.01	SAD -MOUNTAIN FALLS, PAHRUMP	162	03	21	S	54E	NY
A0123	1355	SILVER STATE MATERIALS, LLC	10/9/08	3	AP16111355	CLASS 3 - DBA CALPORTLAND COMPANY	162	13	20	S	53E	NY
A0442	1408	WULFENSTEIN CONSTRUCTION CO, INC.	5/18/09	2	AP14421408.01	CLASS 2 - GAMEBIRD PIT	162	03	21	S	54E	NY
A0325	1484	PLEASANTON VALLEY, LLC	12/1/09	2	AP16291484.01	SAD -RICHLAND ESTATES, PAHRUMP	162	15	19	S	53E	NY
A0111	1501	PAHRUMP VALLEY GRAVEL	1/27/10	3	AP14421501.01	CLASS 3 -MESQUITE PIT	162	02	20	S	53E	NY
A0333	1510	BEAZER HOMES NEVADA	2/25/10	2	AP16291510.01	SAD - BURSON RANCH DEVELOPMENT	162	07	21	S	54E	NY
A0250	1553	WULFENSTEIN CONSTRUCTION COMPANY, INC.	10/17/10	2	AP14421553.01	CLASS 2 - WHEELER PIT, PAHRUMP	162	13	20	S	53E	NY
A0725	2182	WF DEVELOPMENT, LLC	7/19/06	2	AP16292182	SAD - PARADISO VILLAS @ MOUNTAIN FALLS	162	04	21	S	54E	NY
A0853	2355	WULFENSTEIN CONSTRUCTION	8/23/07	3	AP32732355	CLASS 3 - BASIN AVE. & PANORAMA ROAD	162	11	20	S	53E	NY
A0121	2466	SERVICE ROCK PRODUCTS	7/8/08	3	AP16112466	CLASS 3	162	12	20	S	53E	NY
A0965	2491	AWESOME CONSTRUCTION, LLC	9/12/08	2	AP16292491	SAD	162	29	20	S	54E	NY
A0109	2547	NEVADA QUALITY ROCK	8/5/09	3	AP14422547	CLASS 3	162	02	20	S	53E	NY
A1023	2562	VERIZON WIRELESS LLC	6/18/09	3	AP48122562	CLASS 3 - PAHRUMP CELL SITE	162	33	20	S	53E	NY
A1080	2635	ALBERTSON AND SONS SAND & GRAVEL	1/8/10	2	AP14422635	SAD	162	29	20	S	54E	NY
A0446	2695	SOUTHSIDE SAND & GRAVEL	7/8/10	3	AP14422695	CLASS 3	162	28	20	S	54E	NY
A1131	2700	MORALES CONSTRUCTION INC	8/26/10	2	AP14422700	CLASS 2 - MORALES GRAVEL PIT	162	29	20	S	54E	NY
A0116	2718	FLOYD'S CONSTRUCTION, INC.	9/8/10	3	AP14422718	CLASS 3 - SHAMROCK PIT	162	11	20	S	53E	NY
A1182	2730	AFFORDABLE CONCEPTS, INC.	9/9/10	2	AP15422730	SAD - MANSE ELEMENTARY SCHOOL	162	21	19	S	53E	NY
A1187	2736	FREHNER CONSTRUCTION CO.	9/12/10	2	AP16112736	SAD - GAMEBIRD ROAD	162	01	21	S	53E	NY
A1193	2748	NYE COUNTY EMERGENCY SERVICES	10/19/10	2	AP16292748	SAD - M.P. TRAINING SITE	162	01	20	S	53E	NY
A1202	2759	CORE CONSTRUCTION SERVICES OF NEVADA INC	11/23/10	2	AP15422759	SAD - PAHRUMP VALLEY H.S. PROJECT	162	22	20	S	53E	NY

SAD is a Surface Area Disturbance permit for dust control

Class 2 is a stationary minor source

Class 3 is a stationary minor source subject to a facility-wide 5 tpy cumulative emissions cap for all pollutants

Nye County Facilities Evaluated for Potential Cumulative Impacts

1. Sort by issue date ; eliminate any issued before 1/1/2010

2. Eliminate all Class 3 permits as emissions are below the 5 tpy threshold

3. Use Earthpoint Township/Range/Section overlay on Google Earth and Google Earth measuring tool to determine distances between facility location and HHSEGS property boundary. Nearest facilities to HHSEGS are in Township 21. Distances to those two facilities (Beazer Homes Nevada and Frehner Construction Co) are 8.7 and 10.0 miles, respectively—over 6 miles from property boundary. Since all other facilities are farther away, none of the listed facilities is within the 6 mile criterion for further evaluation.

FIN	Fac. Seq.	Company Name	Issue Date	Class	Facility ID	Facility Name	Basin	Section	Township	North/South	Range	County	Distance to HHSEGS Boundary (mi)
A0216	1085	WULFENSTEIN CONSTRUCTION CO, INC	1/20/11	2	AP16291085.02	SAD -BLM PIT, 3 MI. S. OF PAHRUMP	162	29	20	S	54E	NY	
A1202	2759	CORE CONSTRUCTION SERVICES OF NEVADA INC	11/23/10	2	AP15422759	SAD - PAHRUMP VALLEY H.S. PROJECT	162	22	20	S	53E	NY	
A1193	2748	NYE COUNTY EMERGENCY SERVICES	10/19/10	2	AP16292748	SAD - M.P. TRAINING SITE	162	01	20	S	53E	NY	
A1187	2736	FREHNER CONSTRUCTION CO.	9/12/10	2	AP16112736	SAD - GAMEBIRD ROAD	162	01	21	S	53E	NY	9.96
A1182	2730	AFFORDABLE CONCEPTS, INC.	9/9/10	2	AP15422730	SAD - MANSE ELEMENTARY SCHOOL	162	21	19	S	53E	NY	
A0116	2718	FLOYD'S CONSTRUCTION, INC.	9/8/10	3	AP14422718	CLASS 3 - SHAMROCK PIT	162	11	20	S	53E	NY	
A0446	2695	SOUTHSIDE SAND & GRAVEL	7/8/10	3	AP14422695	CLASS 3	162	28	20	S	54E	NY	
A0333	1510	BEAZER HOMES NEVADA	2/25/10	2	AP16291510.01	SAD - BURSON RANCH DEVELOPMENT	162	07	21	S	54E	NY	8.66
A0111	1501	PAHRUMP VALLEY GRAVEL	1/27/10	3	AP14421501.01	CLASS 3 -MESQUITE PIT	162	02	20	S	53E	NY	
A0205	0923	WULFCO, LLC	1/26/10	2	AP16290923.02	SAD - WULFENSTEIN COMM. DEV PROJECT	162	33	20	S	54E	NY	
A1080	2635	ALBERTSON AND SONS SAND & GRAVEL	1/8/10	2	AP14422635	SAD	162	29	20	S	54E	NY	
	SAD is a Surface Area Disturbance permit for dust control												
	Class 2 is a stationary minor source												
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Ann Arbor, MI
Tel: (734) 761-6666
Fax: (734) 761-6755

June 2, 2011

Mr. Lewis Wallenmeyer, Director
Clark County Department of Air Quality and Environmental Management
500 S Grand Central Pkwy.
Las Vegas, NV 89155-5210

Re: Cumulative Impacts Analysis
BrightSource Energy Hidden Hills Solar Electric Generating Facility

Dear Mr. Wallenmeyer:

BrightSource Energy (BSE) is proposing to construct a 500 MW solar thermal power plant in southern Inyo County, California, along the California-Nevada state line. A map showing the location of the proposed project is attached. BSE will be submitting an application for a Determination of Compliance to the Great Basin Unified Air Pollution Control District and an Application for Certification to the California Energy Commission for the Hidden Hills Solar Electric Generation Facility in July of this year. As part of the project review, the CEC requires BSE to prepare an analysis of the project's cumulative air quality impacts. This is defined by the CEC as "a cumulative air quality modeling impacts analysis of the project's typical operating mode in combination with other stationary source emissions sources **within a six-mile radius** *which have received construction permits but are not yet operating, or are in the permitting process.*" [Emphasis added.] We have interpreted this as follows:

- Projects for which permits to construct have been issued since January 1, 2010; and
- Projects for which permits to construct have not been issued, but are reasonably foreseeable.

We would like to obtain from DAQEM a list of projects in Clark County located within six miles of the new power plant location for which permits to construct have been issued since January 1, 2010, and for which permits to construct have not been issued, but are reasonably foreseeable, along with sufficient emissions information and stack parameters so that we can include these sources in our air quality modeling. Facilities that meet these criteria but emit only VOCs can be excluded.

Thank you very much for your assistance. If you have any questions regarding the information we are requesting, feel free to call.

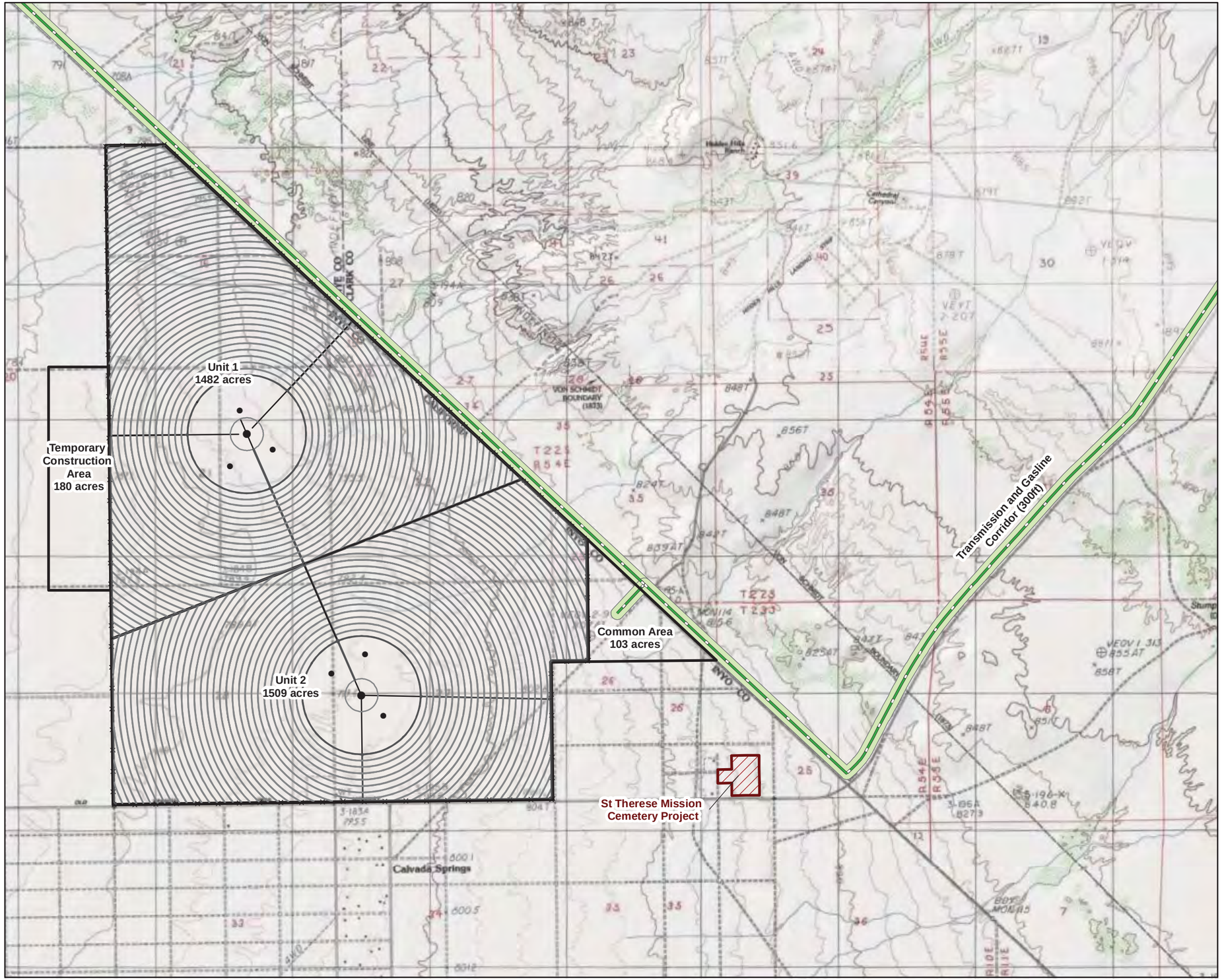
Sincerely,

Nancy Matthews

Nancy Matthews

Attachment

cc: Clay Jensen, BrightSource Energy
Susan Strachan, Strachan Consulting
Jan Sudomier, GBUAPCD



VICINITY MAP

LEGEND

- Solar Towers
- Solar Field Points
- Project Site Fence
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- Survey Corridor (300ft)
- Survey Corridor (300ft)
- St Therese Mission Cemetery Project
- Project Boundary

Notes:
1. Area of interest subject to change.

DRAFT

N

0 1,200 2,400
Feet

Figure 1
Hidden Hills Site and Propsed Transmission Lines
Hidden Hills

SAC \\ZION\SACGIS\PROJ\SOLARPROJECTS\HIDDENHILLS\MAPFILES\2011_HIDDENHILLS\HIDDENHILLS_SITE.PDF.MXD SSCOPES 4/13/2011 4:20:48 PM

CH2MHILL

Nancy L. Matthews

From: Lewis Wallenmeyer <Wallenmeyer@ClarkCountyNV.gov>
Sent: Thursday, June 02, 2011 11:25 AM
To: Nancy L. Matthews
Cc: Jan Sudomier; Tina Gingras; Dennis Ransel; Richard Beckstead
Subject: RE: solar thermal project for southern Inyo County, CA

Thank you for your letter. We will conduct a review and prepare a letter of response to you.

Lewis

Lewis Wallenmeyer
Director
Department of Air Quality and Environmental Management
Clark County
500 S. Grand Central Parkway
P.O. Box 555210
Las Vegas, NV 89155-5210
(702) 455-1600
visit us at: www.clarkcountynv.gov

From: Nancy L. Matthews [mailto:NMatthews@sierraresearch.com]
Sent: Thursday, June 02, 2011 10:47 AM
To: Lewis Wallenmeyer
Cc: Nancy L. Matthews; Jan Sudomier
Subject: solar thermal project for southern Inyo County, CA

Dear Mr. Wallenmeyer—

As Jan Sudomier of the Great Basin Unified APCD indicated last week, a solar project is proposed for development in the Charleston View / Calvada Springs area in the south east corner of Inyo County (near Pahrump). Attached is a letter requesting information regarding other development in the project area.

Thank you very much for your assistance. If you have any questions regarding the information we are requesting, please do not hesitate to call or email me.

Nancy Matthews
916-273-5124

Nancy L. Matthews

From: Richard Beckstead <Beckstead@ClarkCountyNV.gov>
Sent: Friday, August 26, 2011 11:39 AM
To: Nancy L. Matthews; Lewis Wallenmeyer
Cc: Tina Gingras; Dennis Ransel; Harish Agarwal
Subject: RE: solar thermal project for southern Inyo County, CA

Nancy,

I am the Permitting Manager for the Department of Air Quality and Environmental Management. Lewis has requested that I research this and provide you with what information we have available. I am providing this email response since you have stated this would be adequate.

We have five permitted sources in, or near, that hydrographic area, but, none of these are within the 6 miles perimeter of the site you have identified. In fact, it appears the closest permitted source is over 20 miles away. Our search of our records did not indicate any proposed authority to construct projects within the area for which we have received an application.

If there is anything other information you require, please let me know.

Richard D. Beckstead
Permitting Manager - DAQEM
(702) 455-1669
beckstead@ClarkCountyNV.gov

From: Nancy L. Matthews [mailto:NMatthews@sierraresearch.com]
Sent: Thursday, August 25, 2011 3:53 PM
To: Lewis Wallenmeyer
Cc: Tina Gingras; Dennis Ransel; Richard Beckstead; Nancy L. Matthews
Subject: RE: solar thermal project for southern Inyo County, CA

Hi again—

I believe this request may have fallen through the cracks. I apologize for not following up sooner, but we have now filed our application with the California Energy Commission and the Great Basin Unified APCD and we expect that we will receive a request for the cumulative impacts analysis in the next few weeks.

If you have determined that there are no facilities within 6 miles of the project site that meet the criteria outlined in the letter, an email response to that effect would be adequate for our response to the agencies.

If you have any questions regarding this request, please do not hesitate to email me. I will be out of the office for the next 3 weeks, but will be available by email.

Thanks very much--

Nancy Matthews
Sierra Research
1801 J Street

Sacramento, CA 95811
nmatthews@sierraresearch.com
916-273-5124 (direct)
916-444-6666 (main)
916-444-8373 (fax)

From: Lewis Wallenmeyer [mailto:Wallenmeyer@ClarkCountyNV.gov]
Sent: Thursday, June 02, 2011 11:25 AM
To: Nancy L. Matthews
Cc: Jan Sudomier; Tina Gingras; Dennis Ransel; Richard Beckstead
Subject: RE: solar thermal project for southern Inyo County, CA

Thank you for your letter. We will conduct a review and prepare a letter of response to you.

Lewis

Lewis Wallenmeyer
Director
Department of Air Quality and Environmental Management
Clark County
500 S. Grand Central Parkway
P.O. Box 555210
Las Vegas, NV 89155-5210
(702) 455-1600
visit us at: www.clarkcountynv.gov

From: Nancy L. Matthews [mailto:NMatthews@sierraresearch.com]
Sent: Thursday, June 02, 2011 10:47 AM
To: Lewis Wallenmeyer
Cc: Nancy L. Matthews; Jan Sudomier
Subject: solar thermal project for southern Inyo County, CA

Dear Mr. Wallenmeyer—

As Jan Sudomier of the Great Basin Unified APCD indicated last week, a solar project is proposed for development in the Charleston View / Calvada Springs area in the south east corner of Inyo County (near Pahrump). Attached is a letter requesting information regarding other development in the project area.

Thank you very much for your assistance. If you have any questions regarding the information we are requesting, please do not hesitate to call or email me.

Nancy Matthews
916-273-5124

Attachment DR8-1
Supplemental Construction Emissions Impact Analysis

Table DR8-1 below summarizes the calculated emissions from construction equipment as presented in the AFC in Tables 5.1F-1 and 5.1F-2 (pounds per day and tons per year, respectively). Table DR8-2 below summarizes the calculated emissions from construction equipment assuming all offroad equipment is Tier 2-certified; emission factors for each piece of equipment are shown in the attached table. Table DR8-3 below summarizes the daily and annual emissions used for the supplemental construction impacts analysis, assuming that 20% of the offroad construction equipment is Tier 2-certified while the remainder is Tier 3- or 4-certified.[1] Fugitive dust and concrete batch plant emission rates are unchanged from the values used in the original analysis. [2]

Table DR8-1
Construction Equipment Emissions, Tier 3/4 Nonroad Vehicles

	NOx	CO	VOC	SOx	PM2.5	PM10
Daily Emissions During Peak Month (lbs/day)						
Construction Equipment	349.8	181.3	25.9	0.65	15.2	15.2
Annual Construction Emissions During Peak 12-Month Period (tons/year)						
Construction Equipment	31.24	16.55	2.31	0.06	1.28	1.28

Table DR8-2
Construction Equipment Emissions, Tier 2 Nonroad Vehicles

	NOx	CO	VOC	SOx	PM2.5	PM10
Daily Construction Emissions During Peak Month (lbs/day)						
Construction Equipment	522.4	236.4	43.2	0.66	14.5	14.5
Annual Construction Emissions During Peak 12-Month Period (tons/year)						
Construction Equipment	46.23	21.28	3.88	0.06	1.32	1.32

Table DR8-3
Construction Equipment Emissions, 20% Tier 2 and 80% Tier 3/4 Nonroad Vehicles

	NOx	CO	VOC	SOx	PM2.5	PM10
Daily Construction Emissions During Peak Month (lbs/day)						
Construction Equipment	384.4	192.3	29.3	0.65	15.1	15.1
Annual Construction Emissions During Peak 12-Month Period (tons/year)						
Construction Equipment	34.2	17.5	2.62	0.06	1.29	1.29

[1] Specific emission control tier assumptions used for the analysis presented in the AFC are shown in the attached table reproduced from Appendix 5.1F to the original AFC.

[2] An error was discovered in the conversion of PM_{10} emission rate for the batch plant from the pounds per hour emission rate shown in Table 5.1F-1 of the AFC (which is correct) to the gram per second value used for modeling batch plant emissions in the original construction impacts analysis. The conversion error has been corrected in the supplemental analysis results presented here.

Since daily and annual SOx emissions under the 20/80 supplemental scenario are lower than or unchanged from the original construction equipment emissions assumptions, only NOx, CO and $PM_{10}/PM_{2.5}$ emissions were included in the supplemental analysis.[3,]

The results of the supplemental analysis are summarized in Table DR8-4. Predicted impacts that are different under the 20/80 supplemental scenario from those provided in the AFC are shown underlined. Predicted impacts from the Tier 3/4 scenario, as presented in Table 5.1-35 of the AFC, are shown in strike-out font for comparison.

TABLE DR8-4
Modeled Maximum Impacts from Onsite Construction Activities, Assuming 20% of Offroad Vehicles are Tier 2-Certified

Pollutant	Averaging Period	Maximum Predicted Impact ($\mu g/m^3$)	Maximum Background Concentration ($\mu g/m^3$)	Total Concentration[a] ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	CAAQS ($\mu g/m^3$)
NO_2	1-hr (highest)	~~100.1~~ 133.5	117	~~217~~ 251	--	339
	1-hr (98th percntl)	~~85.8~~ 88.0	80.8	~~167~~ 169	188	--
	Annual	~~3.4~~ 3.7	7.5	11	100	57
SO_2	1-hr	0.2	93.6	94	196	655
	3-hr	0.2	23.4	24	1300	--
	24-hr	0.05	13.1	13	--	105
	Annual	0.01	2.7	2.7	80	--
CO	1-hr	~~62.9~~ 66.8	1,750	~~1,813~~ 1,817	40,000	23,000
	8-hr	~~26.7~~ 28.3	1,333	~~1,360~~ 1,361	10,000	10.000
PM_{10}	24-hr	~~24.2~~ 29.3	96	~~120~~ 125	150	50
	Annual	1.4	14	15	--	20
$PM_{2.5}$	24-hr[b]	5.1	11.4	17	35	--
	Annual[c]	0.3	4.9	5.2	15.0	12

Notes:
[a] Total concentrations shown in this table are the sum of the maximum predicted impact and the maximum measured background concentration. Because the maximum impact will not occur at the same time as the maximum background concentration, the actual maximum combined impact will be lower.
[b] Background concentration shown is the three-year average of the 98th percentile values, in accordance with the form of the federal standard. Table 5.1F-8, footnote c.
[c] Background value shown is the three-year average of the annual arithmetic mean, in accordance with the form of the standard.

While the maximum modeled NO_2 and CO impacts with 20% Tier 2-certified construction equipment are predicted to be slightly higher than the impacts evaluated in the AFC, the higher impacts would not change any of the conclusions presented in the AFC; namely, that construction impacts alone for all modeled pollutants are expected to be below the most stringent state and national standards. With the exception of the 24-hour average PM_{10} standard, construction activities are not expected to cause an exceedance of state or federal ambient air quality standards. However, the background

[3] Daily PM emissions decrease when switching from Tier 3/4 to Tier 2 because of the differences in the zero-hour emission factors (see attached page from U.S.EPA's NONROAD model documentation, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling--Compression-Ignition," NR-009D, EPA-420-R-10-018, dated July 2010, available at http://www.epa.gov/otaq/models/nonrdmdl/nonrdmdl2010/420r10018.pdf).

state 24-hour PM_{10} standard is exceeded in the absence of the construction emissions for the project.

Attachment DR8-2
Emission Factors excerpted from
AFC Appendix 5.1F

Tier 3/4 Emission Factors (from Appendix 5.1F of the AFC)

Hidden Hills Construction Equipment Emission Factors

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA

		Tier (Nonroad) Avg mph (Onroad)	Base Emission Factors g/bhp (1)						Transient Adjustment Factor (2)							Adjustment (3)	Adjusted Emission Factors (g/bhp - Nonroad, lb/vmt Onroad)					
Equipment	HP		BSFC lb/hp-hr	NOx	CO	VOC	SOx	PM10	Adj. Type	BSFC	NOx	CO	VOC	SOx	PM10	PM10 Fuel S	BSFC	NOx	CO	VOC	SOx	PM10
Solar Field Assembly and Installation																						
ISO Carrier	290	3	0.367	2.500	0.748	0.184	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.748	0.184	0.005	0.064
Forklift, 10,000 lb (Propane)	90	3	0.408	3.000	2.366	0.184	0.006	0.200	Hi LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0964	0.412	3.120	3.619	0.193	0.006	0.198
Air Compressor, 300 cfm	140	3	0.367	2.500	0.867	0.184	0.005	0.220	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.867	0.184	0.005	0.134
Grader	175	3	0.367	2.500	0.867	0.184	0.005	0.220	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.326	0.193	0.005	0.237
Tractor	75	4	0.408	3.000	2.366	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	2.366	0.184	0.006	0.105
Pylon Insertion Rigs	670	3	0.367	2.500	1.327	0.167	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	1.327	0.167	0.005	0.064
Solar Field Roads Clearing, Grubbing, and Grading																						
Grader	215	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Site Road Work																						
Grader	215	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Scraper	330	3	0.367	2.500	0.843	0.167	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.289	0.175	0.005	0.134
Paver	220	3	0.367	2.500	0.748	0.184	0.005	0.150	HI LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Concrete Batch Plant																						
Loader	270	3	0.367	2.500	0.843	0.167	0.005	0.150	Lo LF	1.18	1.21	2.57	2.29	1.18	2.37	-0.1013	0.433	3.025	2.165	0.382	0.006	0.254
Transmix Trucks	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
Tower and Boiler Erection																						
Strand Jack System	670	3	0.367	2.500	1.327	0.167	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	2.031	0.175	0.005	0.134
Crawler Crane	330	3	0.367	2.500	0.843	0.167	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.843	0.167	0.005	0.064
Rough Terrain Picker, 120 ton	300	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Rough Terrain Picker, 50 ton	190	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Forklift, 10,000 lb	90	3	0.408	3.000	2.366	0.184	0.006	0.200	Hi LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0964	0.412	3.120	3.619	0.193	0.006	0.198
Compressor, 300 cfm	140	3	0.367	2.500	0.867	0.184	0.005	0.220	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.867	0.184	0.005	0.134
Man Lift	75	4	0.408	3.000	2.366	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	2.366	0.184	0.006	0.105
Truck, Semi	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
ACC Erection																						
Crawler Crane	670	3	0.367	2.500	1.327	0.167	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	1.327	0.167	0.005	0.064
Forklft, 50,000 lb	230	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Forklift, 10,000 lb	90	3	0.408	3.000	2.366	0.184	0.006	0.200	Hi LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0964	0.412	3.120	3.619	0.193	0.006	0.198
Man Lift, 40 ft	50	4	0.408	4.728	1.532	0.279	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.728	1.532	0.279	0.006	0.105
Man Lift, 85 ft	75	4	0.408	3.000	2.366	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	2.366	0.184	0.006	0.105
Man Lift, 60 ft	50	4	0.408	4.728	1.532	0.279	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.728	1.532	0.279	0.006	0.105
Truck, Semi	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
Rough Terrain Picker	190	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Compressor, 300 cfm	140	3	0.367	2.500	0.867	0.184	0.005	0.220	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.867	0.184	0.005	0.134
Power Block Erection																						
Crawler Crane	670	3	0.367	2.500	1.327	0.167	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	1.327	0.167	0.005	0.064
Rough Terrain Crane, 65 Ton	250	3	0.367	2.500	0.748	0.184	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.748	0.184	0.005	0.064
Rough Terrain Crane, 35 Ton	160	3	0.367	2.500	0.867	0.184	0.005	0.220	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.867	0.184	0.005	0.134
Welder, 250 amp	20	4	0.408	4.440	2.161	0.438	0.006	0.280	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.440	2.161	0.438	0.006	0.185
Compressor, 125 cfm	60	4	0.408	3.000	2.366	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	2.366	0.184	0.006	0.105
Man Lift, 60 ft	50	4	0.408	4.728	1.532	0.279	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.728	1.532	0.279	0.006	0.105
Man Lift, 85 ft	75	4	0.408	3.000	2.366	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	2.366	0.184	0.006	0.105
Man Lift, 40 ft	50	4	0.408	4.728	1.532	0.279	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.728	1.532	0.279	0.006	0.105
Forklift, 10,000 lb	90	3	0.408	3.000	2.366	0.184	0.006	0.200	Hi LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0964	0.412	3.120	3.619	0.193	0.006	0.198
Rough Terrain Crane, 65 Ton	250	3	0.367	2.500	0.748	0.184	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.748	0.184	0.005	0.064
Miscellaneous																						
Water Truck, 5,000 gal	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
Pickup Trucks (Gasoline)	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.67E-03	2.33E-02	2.45E-03	0.00E+00	8.53E-05
AWD Gators (Gasoline)	25	4	0.408	4.440	2.161	0.438	0.006	0.280	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.440	2.161	0.438	0.006	0.185

Tier 2 Emission Factors

Hidden Hills Construction Equipment Emission Factors

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA

		Tier (Nonroad) Avg mph (Onroad)	Base Emission Factors g/bhp (1)	Transient Adjustment Factor (2)							Adjustment (3)	Adjusted Emission Factors (g/bhp - Nonroad, lb/vmt Onroad)					
Equipment	HP		BSFC lb/hp-hr	Adj. Type	BSFC	NOx	CO	VOC	SOx	PM10	PM10 Fuel S	BSFC	NOx	CO	VOC	SOx	PM10
Solar Field Assembly and Installation																	
ISO Carrier	290	2	0.367	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	4.000	0.748	0.309	0.005	0.046
Forklift, 10,000 lb (Propane)	90	2	0.408	Hi LF	1.01	0.95	1.53	1.05	1.01	1.23	-0.0964	0.412	4.465	3.619	0.386	0.006	0.199
Air Compressor, 300 cfm	140	2	0.367	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	4.100	0.867	0.338	0.005	0.094
Grader	175	2	0.367	Hi LF	1.01	0.95	1.53	1.05	1.05	1.23	-0.0867	0.371	3.895	1.326	0.355	0.005	0.135
Tractor	75	2	0.408	Lo LF	1.18	1.10	2.57	2.29	1.18	1.97	-0.1126	0.481	5.170	6.079	0.841	0.007	0.360
Pylon Insertion Rigs	670	2	0.367	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	4.100	1.327	0.167	0.005	0.046
Solar Field Roads Clearing, Grubbing, and Grading																	
Grader	215	2	0.367	Hi LF	1.01	0.95	1.53	1.05	1.05	1.23	-0.0867	0.371	3.800	1.144	0.324	0.005	0.075
Site Road Work																	
Grader	215	2	0.367	Hi LF	1.01	0.95	1.53	1.05	1.05	1.23	-0.0867	0.371	3.800	1.144	0.324	0.005	0.075
Scraper	330	2	0.367	Hi LF	1.01	0.95	1.53	1.05	1.05	1.23	-0.0867	0.371	4.118	1.289	0.175	0.005	0.075
Paver	220	2	0.367	HI LF	1.01	0.95	1.53	1.05	1.05	1.23	-0.0867	0.371	3.800	1.144	0.324	0.005	0.075
Concrete Batch Plant																	
Loader	270	2	0.367	Lo LF	1.18	1.10	2.57	2.29	1.18	1.97	-0.1013	0.433	4.400	1.921	0.706	0.006	0.158
Transmix Trucks	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
Tower and Boiler Erection																	
Strand Jack System	670	2	0.367	Hi LF	1.01	0.95	1.53	1.05	1.05	1.23	-0.0867	0.371	3.895	2.031	0.175	0.005	0.075
Crawler Crane	330	2	0.367	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	4.335	0.843	0.167	0.005	0.046
Rough Terrain Picker, 120 ton	300	2	0.367	Hi LF	1.01	0.95	1.53	1.05	1.05	1.23	-0.0867	0.371	3.800	1.144	0.324	0.005	0.075
Rough Terrain Picker, 50 ton	190	2	0.367	Hi LF	1.01	0.95	1.53	1.05	1.05	1.23	-0.0867	0.371	3.800	1.144	0.324	0.005	0.075
Forklift, 10,000 lb	90	2	0.408	Hi LF	1.01	0.95	1.53	1.05	1.01	1.23	-0.0964	0.412	4.465	3.619	0.386	0.006	0.199
Compressor, 300 cfm	140	2	0.367	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	4.100	0.748	0.309	0.005	0.046
Man Lift	75	2	0.408	Lo LF	1.18	1.10	2.57	2.29	1.18	1.97	-0.1126	0.481	5.170	6.079	0.841	0.007	0.360
Truck, Semi	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
ACC Erection																	
Crawler Crane	670	2	0.367	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	4.100	1.327	0.167	0.005	0.046
Forklift, 50,000 lb	230	2	0.367	Hi LF	1.01	0.95	1.53	1.05	1.01	1.23	-0.0867	0.371	3.800	1.144	0.324	0.005	0.075
Forklift, 10,000 lb	90	2	0.408	Hi LF	1.01	0.95	1.53	1.05	1.01	1.23	-0.0964	0.412	4.465	3.619	0.386	0.006	0.199
Man Lift, 40 ft	50	2	0.408	Lo LF	1.18	1.10	2.57	2.29	1.18	1.97	-0.1126	0.481	5.201	3.938	0.639	0.007	0.555
Man Lift, 85 ft	75	2	0.408	Lo LF	1.18	1.10	2.57	2.29	1.18	1.97	-0.1126	0.481	5.170	6.079	0.841	0.007	0.360
Man Lift, 60 ft	50	2	0.408	Lo LF	1.18	1.10	2.57	2.29	1.18	1.97	-0.1126	0.481	5.201	3.938	0.639	0.007	0.555
Truck, Semi	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
Rough Terrain Picker	190	2	0.367	Hi LF	1.01	0.95	1.53	1.05	1.05	1.23	-0.0867	0.371	3.800	1.144	0.324	0.005	0.075
Compressor, 300 cfm	140	2	0.367	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	4.100	0.748	0.309	0.005	0.046
Power Block Erection																	
Crawler Crane	670	2	0.367	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	4.100	1.327	0.167	0.005	0.046
Rough Terrain Crane, 65 Ton	250	2	0.367	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	4.000	0.748	0.309	0.005	0.046
Rough Terrain Crane, 35 Ton	160	2	0.367	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	4.100	0.748	0.309	0.005	0.046
Welder, 250 amp	20	2	0.408	Lo LF	1.18	1.10	2.57	2.29	1.00	1.97	-0.1126	0.481	4.884	5.554	1.003	0.006	0.412
Compressor, 125 cfm	60	2	0.408	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.700	2.366	0.367	0.006	0.145
Man Lift, 60 ft	50	2	0.408	Lo LF	1.18	1.10	2.57	2.29	1.18	1.97	-0.1126	0.481	5.201	3.938	0.639	0.007	0.555
Man Lift, 85 ft	75	2	0.408	Lo LF	1.18	1.10	2.57	2.29	1.18	1.97	-0.1126	0.481	5.170	6.079	0.841	0.007	0.360
Man Lift, 40 ft	50	2	0.408	Lo LF	1.18	1.10	2.57	2.29	1.18	1.97	-0.1126	0.481	5.201	3.938	0.639	0.007	0.555
Forklift, 10,000 lb	90	2	0.408	Hi LF	1.01	0.95	1.53	1.05	1.01	1.23	-0.0964	0.412	4.465	3.619	0.386	0.006	0.199
Rough Terrain Crane, 65 Ton	250	2	0.367	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	4.000	0.748	0.309	0.005	0.046
Miscellaneous																	
Water Truck, 5,000 gal	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
Pickup Trucks (Gasoline)	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.67E-03	2.33E-02	2.45E-03	0.00E+00	8.53E-05
AWD Gators (Gasoline)	25	2	0.408	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.440	2.161	0.438	0.006	0.171

Notes: Combustion Emissions

(1) - Steady State Emission Factors from Table A4 of EPA July 2010 NR-009d Publication.

(2) - In use adjustment factors per Table A5 EPA July 2010 NR-009d Publication.

(3) - PM10 and SO2 adjustments due to Equation 5 on page 22 of EPA July 2010 Report No. NR-009d.

Table 7. Summary of the Basis for the PM_{10} Zero-Hour Steady-State CI Emission Factors in NONROAD2008a

HP	PM_{10} g/hp-hr									
	Tier 0[a]	T0 Basis	Tier 1	T1 Basis	Tier 2	T2 Basis[b]	Tier 3	T3 Basis[b]	Tier 4[e]	T4 Basis
>0 to 11	1	OFFROAD	0.4474	cert	0.50	(1) The NOx T1 EF exceeds the T2 std. To meet NOx T2, changes are likely to increase PM. The T2 PM EF is therefore expected to be greater than 0.44 (T1 EF) and less than 0.60 (T2 std); 0.50 chosen as a reasonable value.	na		0.28	8% margin from 0.3 std
>11 to 16	0.9	OFFROAD	0.2665	cert	0.2665	(3) Same as T1 (since T1 EF still below T2 std)	na		0.28	8% margin from 0.3 std
>16 to 25	0.9	OFFROAD	0.2665	cert	0.2665	(3) Same as T1 (since T1 EF still below T2 std)	na		0.28	8% margin from 0.3 std
>25 to 50	0.8	OFFROAD	0.3389	cert	0.3389	(3) Same as T1 (since T1 EF still below T2 std)	na		0.0184[c]	8% margin from 0.02 std
>50 to 75	0.722	EF data	0.4730		0.24	(4) 20% highway-based margin from std (since T1 EF exceeds T2 std, cannot be used)	0.30	(1) T3 std	0.0184[c]	8% margin from 0.02 std
>75 to 100	0.722	EF data	0.4730		0.24	(4) 20% highway-based margin from std (since T1 EF exceeds T2 std, cannot be used)	0.30	(1) T3 std	0.0092	8% margin from 0.01 std
>100 to 175	0.402	EF data	0.2799		0.18	(4) 20% highway-based margin from std (since T1 EF exceeds T2 std, cannot be used)	0.22	(1) T3 std	0.0092	8% margin from 0.01 std
>175 to 300	0.402	EF data	0.2521	cert	0.1316	(2) T2 EF for >300 to 600hp category applied to these hp categories. Rationale: All four hp categories meet same PM std. Also, T2 EF of 0.1316 based on actual certification data.	0.15	(1) T3 std	0.0092	8% margin from 0.01 std
>300 to 600	0.402	EF data	0.2008	cert	0.1316		0.15	(1) T3 std	0.0092	8% margin from 0.01 std
>600 to 750	0.402	EF data	0.2201	cert	0.1316		0.15	(1) T3 std	0.0092	8% margin from 0.01 std
>750 except gen sets	0.402	EF data	0.1934	cert	0.1316		na		0.0276[d]	8% margin from 0.03 std
Gen sets >750 to 1200	0.402	EF data	0.1934	cert	0.1316		na		0.0184[d]	8% margin from 0.02 std
Gen sets >1200	0.402	EF data	0.1934	cert	0.1316		na		0.0184[d]	8% margin from 0.02 std

[a] Tier 0 represents 1988+ MY engines for MYs prior to Tier 1. Separate EFs are also provided for Base (pre-1988 MY) engines. For ≤50hp engines, Base EF = Tier 0 EF. For >50hp engines, the Base EFs vary by application, so are not provided in this table.
[b] Numbers in brackets correspond to the option selected, which is briefly described here. For more details regarding the options, consult the text. The derivation of the highway-based compliance margins are discussed in Appendix E.
[c] For >25 to 75 hp engines, there is also a transitional Tier 4 PM standard of 0.22 g/hp-hr in 2008-2012. The corresponding PM EF in NONROAD is 0.20 g/hp-hr.
[d] For all engines >750 hp, there is also a transitional Tier 4 PM standard of 0.075 g/hp-hr in 2011-2014. The corresponding PM EF in NONROAD is 0.069 g/hp-hr.
[e] Tier 4 emission factors are considered to be transient, rather than steady-state.

Attachment DR9-1
Construction Equipment Emissions Calculations from Appendix 5.1F of the AFC

Hidden Hills Construction Equipment Emission Factors

Hidden Hills Solar Electric Generating System (Total Both Plants)--Inyo Co., CA

		Tier (Nonroad) Avg mph (Onroad)	Base Emission Factors g/bhp (1)						Transient Adjustment Factor (2)							Adjustment (3)	Adjusted Emission Factors (g/bhp - Nonroad, lb/vmt Onroad)					
Equipment	HP		BSFC lb/hp-hr	NOx	CO	VOC	SOx	PM10	Adj. Type	BSFC	NOx	CO	VOC	SOx	PM10	PM10 Fuel S	BSFC	NOx	CO	VOC	SOx	PM10
Solar Field Assembly and Installatior																						
ISO Carrier	290	3	0.367	2.500	0.748	0.184	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.748	0.184	0.005	0.064
Forklift, 10,000 lb (Propane)	90	3	0.408	3.000	2.366	0.184	0.006	0.200	Hi LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0964	0.412	3.120	3.619	0.193	0.006	0.198
Air Compressor, 300 cfm	140	3	0.367	2.500	0.867	0.184	0.005	0.220	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.867	0.184	0.005	0.134
Grader	175	3	0.367	2.500	0.867	0.184	0.005	0.220	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.326	0.193	0.005	0.237
Tractor	75	4	0.408	3.000	2.366	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	2.366	0.184	0.006	0.105
Pylon Insertion Rigs	670	3	0.367	2.500	1.327	0.167	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	1.327	0.167	0.005	0.064
Solar Field Roads Clearing, Grubbing, and Grading																						
Grader	215	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Site Road Work																						
Grader	215	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Scraper	330	3	0.367	2.500	0.843	0.167	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.289	0.175	0.005	0.134
Paver	220	3	0.367	2.500	0.748	0.184	0.005	0.150	HI LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Concrete Batch Plant																						
Loader	270	3	0.367	2.500	0.843	0.167	0.005	0.150	Lo LF	1.18	1.21	2.57	2.29	1.18	2.37	-0.1013	0.433	3.025	2.165	0.382	0.006	0.254
Transmix Trucks	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
Tower and Boiler Erection																						
Strand Jack System	670	3	0.367	2.500	1.327	0.167	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	2.031	0.175	0.005	0.134
Crawler Crane	330	3	0.367	2.500	0.843	0.167	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.843	0.167	0.005	0.064
Rough Terrain Picker, 120 ton	300	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Rough Terrain Picker, 50 ton	190	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Forklift, 10,000 lb	90	3	0.408	3.000	2.366	0.184	0.006	0.200	Hi LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0964	0.412	3.120	3.619	0.193	0.006	0.198
Compressor, 300 cfm	140	3	0.367	2.500	0.867	0.184	0.005	0.220	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.867	0.184	0.005	0.134
Man Lift	75	4	0.408	3.000	2.366	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	2.366	0.184	0.006	0.105
Truck, Semi	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
ACC Erection																						
Crawler Crane	670	3	0.367	2.500	1.327	0.167	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	1.327	0.167	0.005	0.064
Forklft, 50,000 lb	230	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Forklift, 10,000 lb	90	3	0.408	3.000	2.366	0.184	0.006	0.200	Hi LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0964	0.412	3.120	3.619	0.193	0.006	0.198
Man Lift, 40 ft	50	4	0.408	4.728	1.532	0.279	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.728	1.532	0.279	0.006	0.105
Man Lift, 85 ft	75	4	0.408	3.000	2.366	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	2.366	0.184	0.006	0.105
Man Lift, 60 ft	50	4	0.408	4.728	1.532	0.279	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.728	1.532	0.279	0.006	0.105
Truck, Semi	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
Rough Terrain Picker	190	3	0.367	2.500	0.748	0.184	0.005	0.150	Hi LF	1.01	1.04	1.53	1.05	1.05	1.47	-0.0867	0.371	2.600	1.144	0.193	0.005	0.134
Compressor, 300 cfm	140	3	0.367	2.500	0.867	0.184	0.005	0.220	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.867	0.184	0.005	0.134
Power Block Erection																						
Crawler Crane	670	3	0.367	2.500	1.327	0.167	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	1.327	0.167	0.005	0.064
Rough Terrain Crane, 65 Ton	250	3	0.367	2.500	0.748	0.184	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.748	0.184	0.005	0.064
Rough Terrain Crane, 35 Ton	160	3	0.367	2.500	0.867	0.184	0.005	0.220	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.867	0.184	0.005	0.134
Welder, 250 amp	20	4	0.408	4.440	2.161	0.438	0.006	0.280	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.440	2.161	0.438	0.006	0.185
Compressor, 125 cfm	60	4	0.408	3.000	2.366	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	2.366	0.184	0.006	0.105
Man Lift, 60 ft	50	4	0.408	4.728	1.532	0.279	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.728	1.532	0.279	0.006	0.105
Man Lift, 85 ft	75	4	0.408	3.000	2.366	0.184	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	3.000	2.366	0.184	0.006	0.105
Man Lift, 40 ft	50	4	0.408	4.728	1.532	0.279	0.006	0.200	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.728	1.532	0.279	0.006	0.105
Forklift, 10,000 lb	90	3	0.408	3.000	2.366	0.184	0.006	0.200	Hi LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0964	0.412	3.120	3.619	0.193	0.006	0.198
Rough Terrain Crane, 65 Ton	250	3	0.367	2.500	0.748	0.184	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0859	0.367	2.500	0.748	0.184	0.005	0.064
Miscellaneous																						
Water Truck, 5,000 gal	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.12E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
Pickup Trucks (Gasoline)	250	10.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.67E-03	2.33E-02	2.45E-03	0.00E+00	8.53E-05
AWD Gators (Gasoline)	25	4	0.408	4.440	2.161	0.438	0.006	0.280	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.440	2.161	0.438	0.006	0.185

Attachment DR17-1
Record of Communication with
Southern Inyo Fire Protection District

CH2MHILL TELEPHONE CONVERSATION RECORD

Call To:	Captain Larry Levy		Southern Inyo County Fire District/ Captain
Phone No.:	775-513-5675	**Date:**	Nov 01, 2011
Call From:	Ashraf Shaqadan	**Time:**	3:33 PM
Message Taken By:	Ashraf Shaqadan		
Subject:	Medical Emergency Response		

I called Laurence (Larry) Levy who is the Captain of Southern Inyo County Fire District. I asked Captain Levy about the first response to medical emergencies on the site of the Hidden Hills Solar Energy Project.

Captain Levy informed me that first response to medical emergencies at the site would come from the Southern Inyo County Fire District, Tecopa Station (at 410 Tecopa Hot Springs Road). The Tecopa Fire station has 12 volunteer firefighters with first response medical training called Basic Life Support training (BLS). The Tecopa station has one ambulance staffed with 3 personnel. Also, one fire truck with 2 personnel would likely respond. The response time from Tecopa station is approximately 30 minutes.

If advanced medical care is needed, the responding team may call Mercy Air paramedic to transport trauma injuries to the University Medical Center in Las Vegas (1800 West Charleston Blvd., Las Vegas, NV 89102). The response time for Mercy Air is 10 minutes. Patients with illnesses and non-trauma injuries are transported to Desert View Hospital in Pahrump (360 South Lola Lane Pahrump, NV 89048).

There is a mutual aid agreement with Pahrump Valley Fire District which has 40 full time firefighters with three medical training levels: basic, intermediate, and advanced life support training. The response time from any Pahrump Valley Fire District station is approximately 30 minutes. Captain Levy was not sure which stations in Pahrump would respond first.

Larry Levy
Fire Captain
South Inyo County Fire District
410 Tecopa Hot Springs RD
Tecopa , California 92389-0051

Tel: 775-513-5675
Email: levy2717@access4less.net

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Attachment DR17-2
Record of Communication with Pahrump Fire Rescue

CALIFORNIA ENERGY COMMISSION

REPORT OF CONVERSATION

DOCKET
11-AFC-2
DATE SEP 16 2011
RECD. NOV 08 2011

Siting, Transportation, and Environmental Protection Division

FILE: 11-AFC-2

PROJECT TITLE: Hidden Hills SEGS

☒ **Telephone**	916-654-4545/ 775-727-5658	☐ **Meeting Location:**	
NAME:	Lisa Worrall	**DATE:** September 16, 2011	**TIME:** 9 am
WITH:	Fire Chief Scott F. Lewis, Pahrump Valley Fire Rescue Services, Pahrump, NV		
SUBJECT:	Pahrump Valley Fire Rescue Services Resources		

I spoke with Fire Chief Lewis with the Pahrump Valley Fire Rescue Services (PVFRS) in Pahrump, Nevada. The following are notes from our conversation:

- PVFRS would respond to medical emergencies at the HHSEGS project site with an Advanced Life Support (ALS) ambulance upon request. PVFRS will respond based on a mutual aid request initiated by SIFPD. The PVFRS service area extends to Front Site Firearms Training Institute on Old Spanish Trail.
- PVFRS will respond to trauma or industrial accidents with an ALS ambulance, Heavy Rescue, and can request a helicopter if necessary and based on their availability (weather, other calls, etc.).
- While SIFPD is the incident command, in reality because PVFRS is the closest responder with Advanced Life Support (ALS) capabilities, they are the ones that respond to emergency medical calls. They are also staffed 24 hours a day.
- It takes longer for volunteer staff to respond to calls in comparison to regular staff as regular staff are already assembled at the station and can respond right away and with volunteer staff, calls needs to be placed to get the volunteers to the station, and once at the station, they can then respond. SIFPD has volunteer firefighters in the area known locally as Charleston View.
- PVFRS has access to Mercy Air and can transport patients in a serious condition (serious cardiac arrest, stroke, large laceration, etc.) to University Hospital Medical Center (UMC) in Las Vegas in 20 minutes. If the patient is not serious then their paramedic ambulance transports the patient to Desert View in Pahrump.
- There is no Nye County Fire District, rather services are provided by PVFRS plus a group of volunteers available through the county. Nye County Emergency Services (NCES) is more of an umbrella organization.

cc: Project file Dick Ratliff, Staff Counsel	**Prepared by:** Lisa Worrall

Attachment DR26-1
FAA Application Form for Determination of No Hazard Unit 1

Notice of Proposed Construction or Alteration - Off Airport

Project Name: BRIGH-000170908-11 Sponsor: BrightSource Energy, Inc.

Details for Case : Unit 1

Show Project Summary

Case Status

ASN:	2011-AWP-1954-OE	Date Accepted:	03/30/2011
Status:	Accepted	Date Determined:	
		Letters:	None
		Documents:	None

Construction / Alteration Information

Notice Of:	Construction
Duration:	Permanent
if Temporary :	Months: Days:
Work Schedule - Start:	
Work Schedule - End:	
State Filing:	

Structure Summary

Structure Type:	Solar Tower
Structure Name:	Unit 1
NOTAM Number:	
FCC Number:	
Prior ASN:	

Structure Details

Latitude:	35° 59' 46.41'' N
Longitude:	115° 54' 22.00'' W
Horizontal Datum:	NAD83
Site Elevation (SE):	2605 (nearest foot)
Structure Height (AGL): ** If the entered AGL is a proposed change to an existing structure's height include the current AGL in the Description of Proposal.*	820 (nearest foot)
Requested Marking/Lighting:	White-medium intensity
Other :	
Recommended Marking/Lighting:	
Current Marking/Lighting:	N/A New Structure
Other :	
Nearest City:	Pahrump
Nearest State:	California
Description of Location: *On the Project Summary page upload any certified survey.*	Tower located in California, east of Shoshone and Tecopa, south of Pahrump, NV
Description of Proposal:	Filing one of two solar towers

Common Frequency Bands

Low Freq	High Freq	Freq Unit	ERP	ERP Unit

Specific Frequencies

Attachment DR26-2
FAA Application Form for Determination of No Hazard Unit 2

Notice of Proposed Construction or Alteration - Off Airport

Project Name: BRIGH-000170908-11 Sponsor: BrightSource Energy, Inc.

Details for Case : Unit 2

Show Project Summary

Case Status

ASN:	2011-AWP-1955-OE	Date Accepted:	03/30/2011
Status:	Accepted	Date Determined:	
		Letters:	None
		Documents:	None

Construction / Alteration Information

Notice Of:	Construction
Duration:	Permanent
if Temporary :	Months: Days:
Work Schedule - Start:	
Work Schedule - End:	
State Filing:	

Structure Summary

Structure Type:	Solar Tower
Structure Name:	Unit 2
NOTAM Number:	
FCC Number:	
Prior ASN:	

Structure Details

Latitude:	35° 58' 44.11'' N
Longitude:	115° 53' 49.37'' W
Horizontal Datum:	NAD83
Site Elevation (SE):	2609 (nearest foot)
Structure Height (AGL): ** If the entered AGL is a proposed change to an existing structure's height include the current AGL in the Description of Proposal.*	820 (nearest foot)
Requested Marking/Lighting:	White-medium intensity
Other :	
Recommended Marking/Lighting:	
Current Marking/Lighting:	N/A New Structure
Other :	
Nearest City:	Pahrump
Nearest State:	California
Description of Location: *On the Project Summary page upload any certified survey.*	Tower located in California, east of Shoshone and Tecopa, south of Pahrump, NV
Description of Proposal:	Filing one of two solar towers

Common Frequency Bands

Low Freq	High Freq	Freq Unit	ERP	ERP Unit

Specific Frequencies

Attachment DR27-1
FAA Determination of
No Hazard to Air Navigation Unit 1

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
2601 Meacham Boulevard
Fort Worth, TX 76137

Aeronautical Study No.
2011-AWP-1954-OE

Issued Date: 09/02/2011

Clay Jensen
BrightSource Energy, Inc.
1999 Harrison Street, Suite 2150
Oakland, CA 94612

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Tower Unit 1
Location:	Pahrump, CA
Latitude:	35-59-46.41N NAD 83
Longitude:	115-54-22.00W
Heights:	820 feet above ground level (AGL) 3425 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, 24-hr med-strobes - Chapters 4,6(MIWOL),&12.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part I)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part II)

See attachment for additional condition(s) or information.

The use of a 24-hour medium intensity flashing white light system in urban and rural areas often results in complaints.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

Any height exceeding 820 feet above ground level (3425 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 03/02/2013 unless:

(a) extended, revised or terminated by the issuing office.
(b) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before October 02, 2011. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted in triplicate to the Manager, Airspace Regulations & ATC Procedures Group, Federal Aviation Administration, Airspace Regulations & ATC Procedures Group, 800 Independence Ave, SW, Room 423, Washington, DC 20591.

This determination becomes final on October 12, 2011 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Regulations & ATC Procedures Group via telephone -- 202-267-8783 - or facsimile 202-267-9328.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Karen McDonald, at (310) 725-6557. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2011-AWP-1954-OE.

Signature Control No: 139681368-149017019 (DNH)
Sheri Edgett-Baron
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Case Description
Map(s)

Additional information for ASN 2011-AWP-1954-OE

This narrative is prepared for aeronautical study numbers 2011-AWP-1954-OE and 2011-AWP-1955-OE.

The proposal is for one of two solar towers proposed in Inyo County, California, near the California/Nevada state border. The closest military or civilian public-use landing area to the sites is the proposed civilian Pahrump Valley Airport (00WE) which is planned in Nevada. The solar tower sites are located approximately 10.5 nautical miles and 11.6 nautical miles southeast of the proposed 00WE landing. The elevation of the proposed 00WE landing area will be 2,535 feet above mean sea level (amsl). The site elevations of the two proposed solar towers are 2,605 feet amsl and 2,609 feet amsl, respectively.

The structure heights exceed the Subpart C Obstruction Standards of Title 14 of the Code of Federal Regulations, Part 77 as follows:

Section 77.17(a)(1) by 321 feet, a height more than 499 feet above ground level (agl), at the site.

Details of the proposals were circularized for public comment in order to gather aeronautical information on June 6, 2011. No comments or objections were received from the public.

FAA evaluation finds that the adverse effect of this structure is known. This does not affect the public's right to petition for review determinations regarding structures which exceed the subject obstruction standards.

AERONAUTICAL STUDY FOR POSSIBLE EFFECT UPON THE OPERATION OF AN AIR NAVIGATION AID:

- None.

AERONAUTICAL STUDY FOR POSSIBLE INSTRUMENT FLIGHT RULES (IFR) EFFECT DISCLOSED THE FOLLOWING:

- The proposal would have no effect on any existing or proposed IFR arrival/departure routes, operations, or procedures.

- The proposal would have no effect on any existing or proposed IFR en route routes, operations, or procedures.

- The proposal would have no effect on any existing or proposed IFR minimum flight altitudes.

AERONAUTICAL STUDY FOR POSSIBLE VISUAL FLIGHT RULES (VFR) EFFECT DISCLOSED THE FOLLOWING:

- The proposal would have no effect on any existing or proposed VFR arrival or departure routes, operations or procedures.

- The proposal would not conflict with airspace required to conduct normal VFR traffic pattern operations at any known civilian public-use or military airports.

- The proposal would not penetrate those altitudes normally considered available to airmen for VFR en route flight.

- The two solar tower structures shall be appropriately installed with a 24-hour medium intensity white obstruction lighting system (MIWOL), at the sponsor's request, to achieve conspicuity for airmen flying in VFR weather conditions.

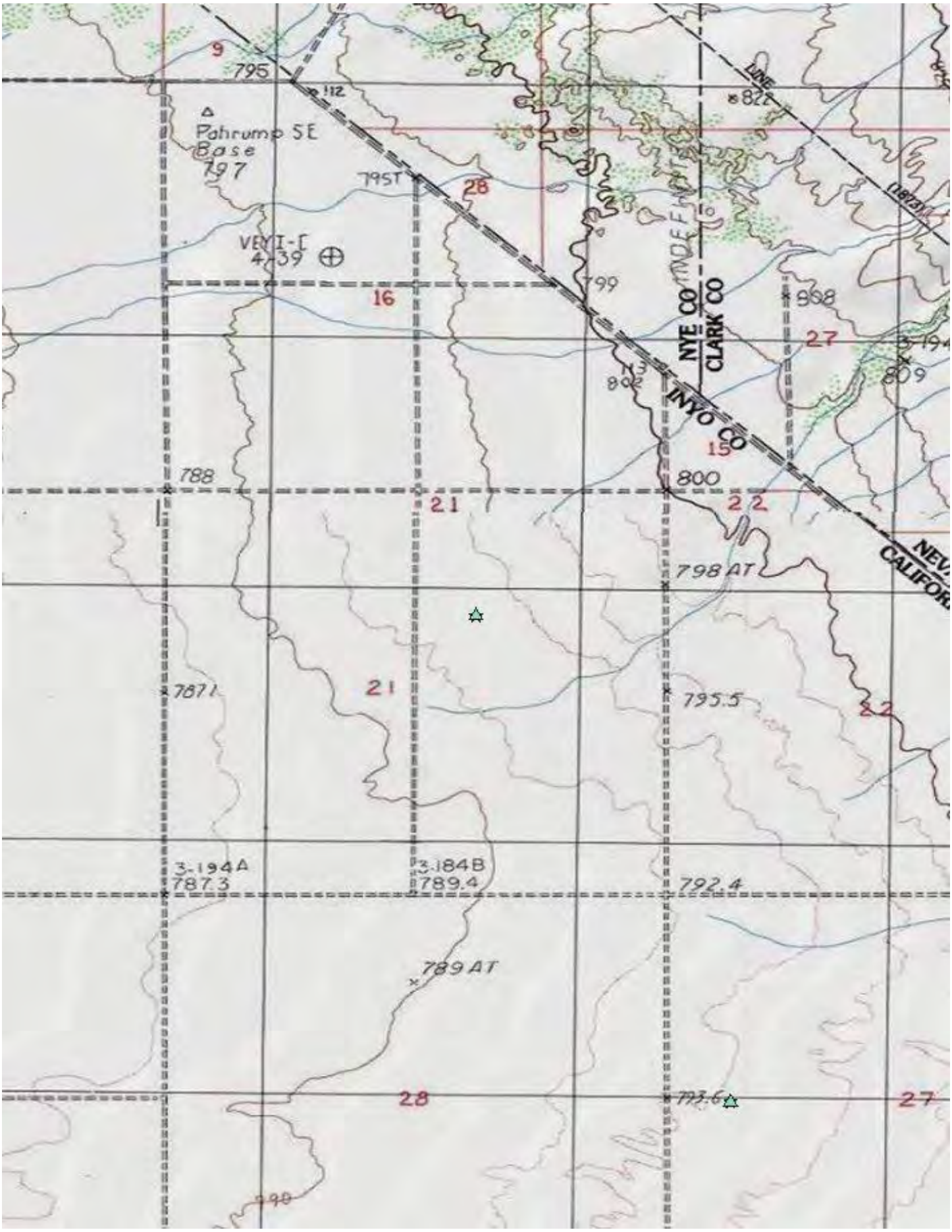
The cumulative impact of the proposed structure, when combined with other existing structures is not considered significant. Study did not disclose any adverse effect on existing or proposed civilian public-use or military airports or navigational facilities. Nor would the proposal affect the capacity of any known existing or planned civilian public-use or military airport.

Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation.

This determination, issued in accordance with Part 77, concerns the effect of the proposal on the safe and efficient use of the navigable airspace by aircraft and does not relieve the sponsor of any compliance responsibilities relating to laws, ordinances, or regulations of any Federal, state, or local governmental bodies.

Determinations, which are issued in accordance with Part 77, do not supersede or override any state, county, or local laws, avigation easements, or ordinances, or local zoning maximum heights.

Filing one of two solar towers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Pahrump SE
Base
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795T
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VERT-E
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799
NYE CO
CLARK CO
INYO CO
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809
15
788
800
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22
798 AT
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21
795.5
22
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27
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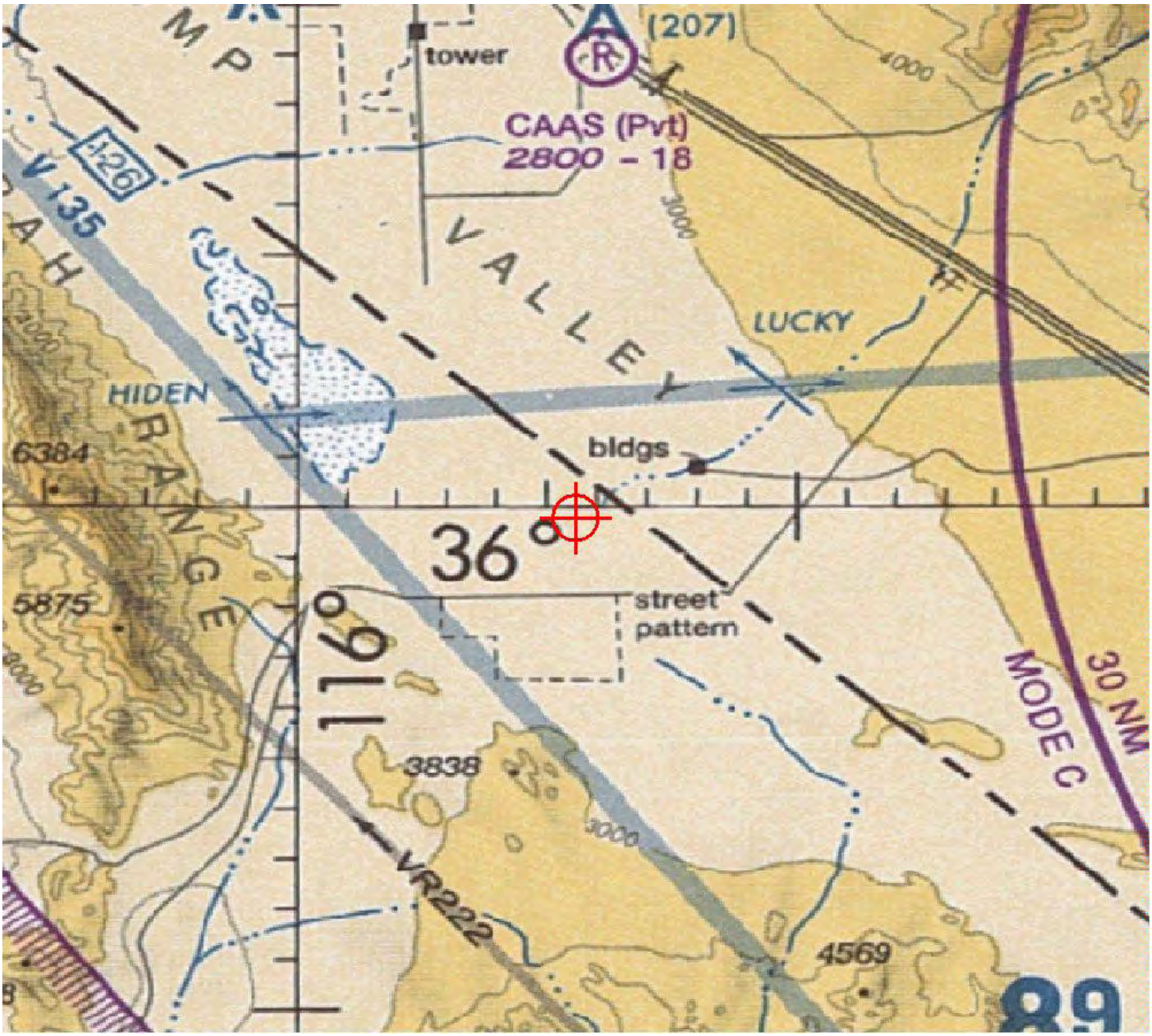
Sectional Map for ASN 2011-AWP-1954-OE



Attachment DR27-2
FAA Determination of
No Hazard to Air Navigation Unit 2

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
2601 Meacham Boulevard
Fort Worth, TX 76137

Aeronautical Study No.
2011-AWP-1955-OE

Issued Date: 09/02/2011

Clay Jensen
BrightSource Energy, Inc.
1999 Harrison Street, Suite 2150
Oakland, CA 94612

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Tower Unit 2
Location:	Pahrump, CA
Latitude:	35-58-44.11N NAD 83
Longitude:	115-53-49.37W
Heights:	820 feet above ground level (AGL)
	3429 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, 24-hr med-strobes - Chapters 4,6(MIWOL),&12.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part I)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part II)

See attachment for additional condition(s) or information.

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Any height exceeding 820 feet above ground level (3429 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 03/02/2013 unless:

(a) extended, revised or terminated by the issuing office.
(b) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before October 02, 2011. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted in triplicate to the Manager, Airspace Regulations & ATC Procedures Group, Federal Aviation Administration, Airspace Regulations & ATC Procedures Group, 800 Independence Ave, SW, Room 423, Washington, DC 20591.

This determination becomes final on October 12, 2011 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Regulations & ATC Procedures Group via telephone -- 202-267-8783 - or facsimile 202-267-9328.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

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This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Karen McDonald, at (310) 725-6557. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2011-AWP-1955-OE.

Signature Control No: 139681370-149017018 (DNH)
Sheri Edgett-Baron
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Case Description
Map(s)

Additional information for ASN 2011-AWP-1955-OE

This narrative is prepared for aeronautical study numbers 2011-AWP-1954-OE and 2011-AWP-1955-OE.

The proposal is for one of two solar towers proposed in Inyo County, California, near the California/Nevada state border. The closest military or civilian public-use landing area to the sites is the proposed civilian Pahrump Valley Airport (00WE) which is planned in Nevada. The solar tower sites are located approximately 10.5 nautical miles and 11.6 nautical miles southeast of the proposed 00WE landing. The elevation of the proposed 00WE landing area will be 2,535 feet above mean sea level (amsl). The site elevations of the two proposed solar towers are 2,605 feet amsl and 2,609 feet amsl, respectively.

The structure heights exceed the Subpart C Obstruction Standards of Title 14 of the Code of Federal Regulations, Part 77 as follows:

Section 77.17(a)(1) by 321 feet, a height more than 499 feet above ground level (agl), at the site.

Details of the proposals were circularized for public comment in order to gather aeronautical information on June 6, 2011. No comments or objections were received from the public.

FAA evaluation finds that the adverse effect of this structure is known. This does not affect the public's right to petition for review determinations regarding structures which exceed the subject obstruction standards.

AERONAUTICAL STUDY FOR POSSIBLE EFFECT UPON THE OPERATION OF AN AIR NAVIGATION AID:

- None.

AERONAUTICAL STUDY FOR POSSIBLE INSTRUMENT FLIGHT RULES (IFR) EFFECT DISCLOSED THE FOLLOWING:

- The proposal would have no effect on any existing or proposed IFR arrival/departure routes, operations, or procedures.

- The proposal would have no effect on any existing or proposed IFR en route routes, operations, or procedures.

- The proposal would have no effect on any existing or proposed IFR minimum flight altitudes.

AERONAUTICAL STUDY FOR POSSIBLE VISUAL FLIGHT RULES (VFR) EFFECT DISCLOSED THE FOLLOWING:

- The proposal would have no effect on any existing or proposed VFR arrival or departure routes, operations or procedures.

- The proposal would not conflict with airspace required to conduct normal VFR traffic pattern operations at any known civilian public-use or military airports.

- The proposal would not penetrate those altitudes normally considered available to airmen for VFR en route flight.

- The two solar tower structures shall be appropriately installed with a 24-hour medium intensity white obstruction lighting system (MIWOL), at the sponsor's request, to achieve conspicuity for airmen flying in VFR weather conditions.

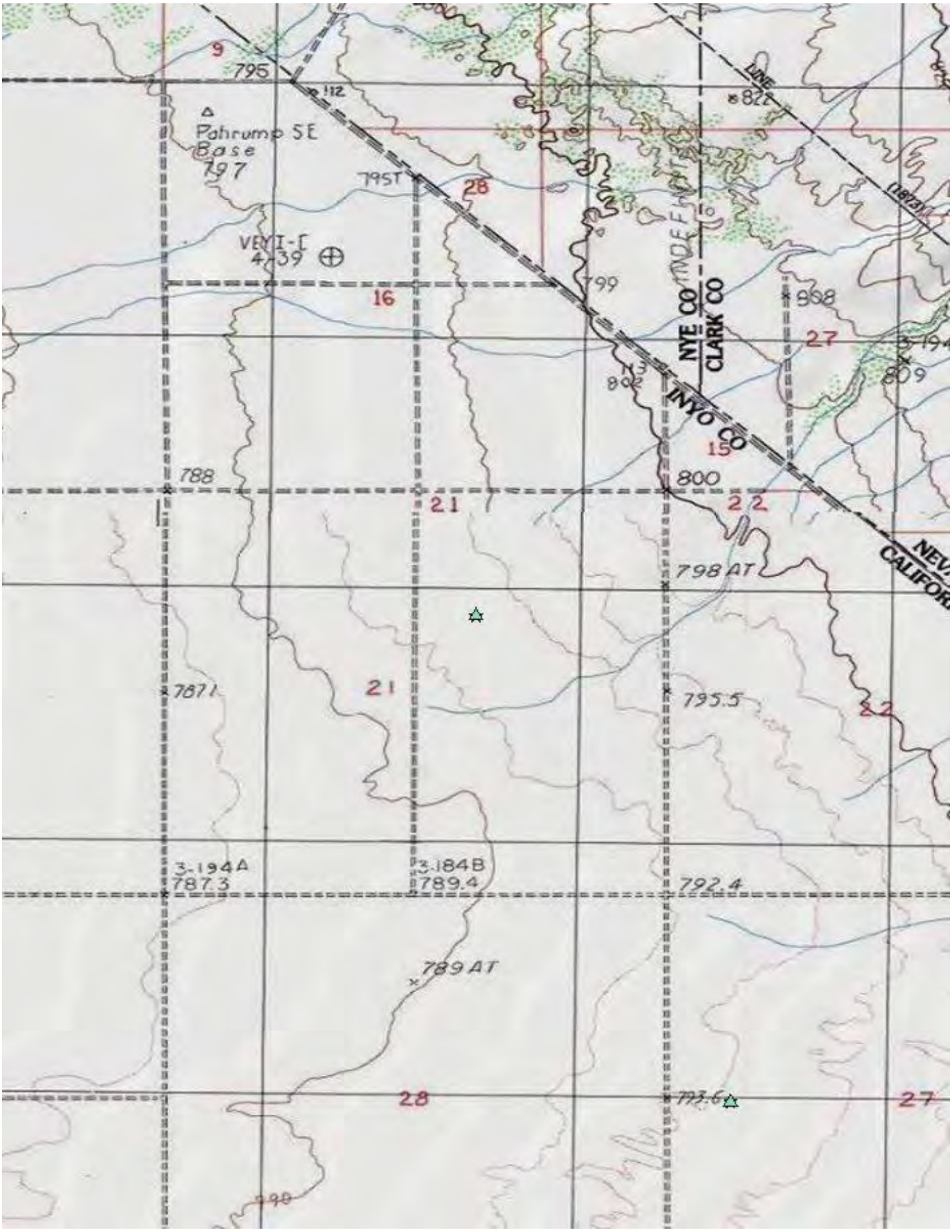
The cumulative impact of the proposed structure, when combined with other existing structures is not considered significant. Study did not disclose any adverse effect on existing or proposed civilian public-use or military airports or navigational facilities. Nor would the proposal affect the capacity of any known existing or planned civilian public-use or military airport.

Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation.

This determination, issued in accordance with Part 77, concerns the effect of the proposal on the safe and efficient use of the navigable airspace by aircraft and does not relieve the sponsor of any compliance responsibilities relating to laws, ordinances, or regulations of any Federal, state, or local governmental bodies.

Determinations, which are issued in accordance with Part 77, do not supersede or override any state, county, or local laws, avigation easements, or ordinances, or local zoning maximum heights.

Filing one of two solar towers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CLARK CO
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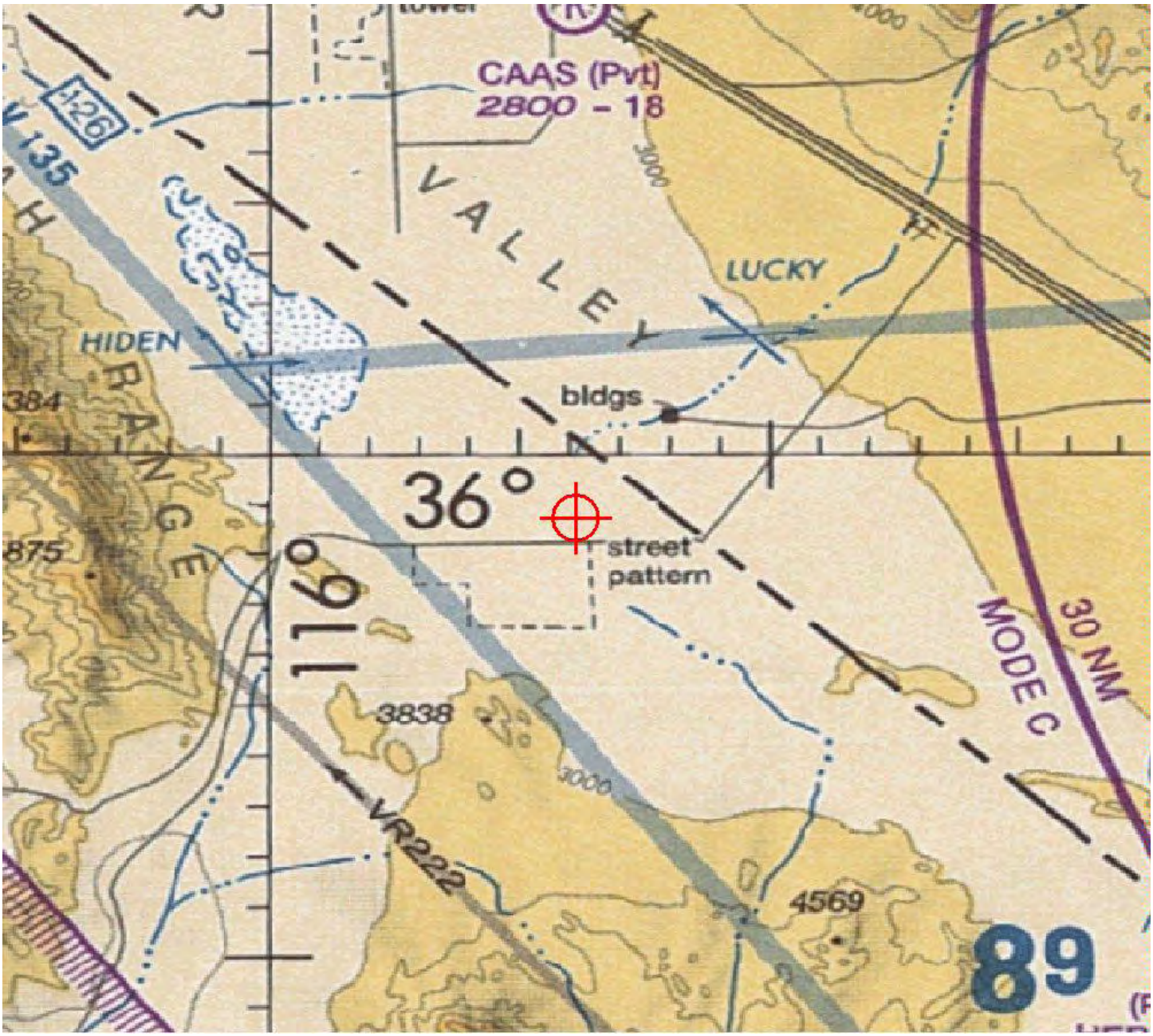
Sectional Map for ASN 2011-AWP-1955-OE



Attachment DR42-1
Data from Online Review of Existing Groundwater Well Data

Water Resource Characterization and Monitoring

Water Resource Sustainability

Water Quality Protection

Resource Management

GWE Well Map

GWE Data Download

Well No. NC-GWE-PV-4

SITE SUMMARY AND DATA

Status: **Completed on 6/05/2010**

Latitude/Longitude (NAD 83) - Approximate:
36° 9' 52.01" N 116° 2' 14.91" W

Legal Description: **T20S R53E S32 SE 1/4**

Total Depth of Borehole (ft):	**180.0**
Total Depth of Well (ft):	**160.7**
Elevation of Ground Surface (ft amsl):	**2559.0**
Elevation of Water (ft amsl):	**2483.6**
Depth to Water (ft bgl):	**75.4**
Screened Interval (ft bgl):	**70-150**
Sandpack Depth (ft bgs):	**65-180**
Estimated Airlifted Water Production (gpm):	**25**
Alluvium Thickness (ft):	**1000**

(depth to water values based on post-drilling measurements taken in March 2011)

Contact Intervals (ft bgl)	Stratigraphic Unit
0-180	Lean Clay

Access: There are several access routes possible to NC-GWE-PV-4. The one shown is from the intersection of Nevada Highway 372 and Red Rock Drive heading south on Red Rock Drive about 1.7 miles. Turn right onto W. Calvada Blvd and proceed about 0.4 miles. Take the first left onto Winchester Avenue and drive south for about 1.4 miles. Take a left onto Marion Miller Street and go east about 0.4 miles and turn left onto S. Tumbleweed Avenue, and go north about 0.1 mile. NC-GWE-PV-4 will be on the left side of the road. Click on the thumbnail image for a larger view.

Purpose - Groundwater Conditions in Pahrump Valley:
NC-GWE-PV-4 is one of five boreholes and wells that were drilled to infill data gaps in the Water Level Monitoring Program (WLMP), especially on the Pahrump Fan.

Data:

RID	Description	Data	Metadata	Date

Well Completion Diagrams				
7805.02	**NC-GWE-PV-4** Well Completion Diagram	rid7805_02.pdf	meta7805_02.pdf	6/10/11
Geophysical Data				
7783	**NC-GWE-PV-4** Open Hole Geophysical Logs, including: natural gamma, 8-, 16-, 32-, and 64-inch normal and lateral resistivity, fluid temperature, fluid resistivity, and caliper logs. Data collected on 6/05/10; Data are in log ASCII format (.las).	rid7783.zip	meta7783.pdf	10/20/10
7851	**NC-GWE-PV-4** Completion Geophysical Logs, including: natural gamma, 8-, 16-, 32-, and 64-inch normal and lateral resistivity, fluid temperature, fluid resistivity, and density logs. Data collected on 12/16/2010; Data are in log ASCII format (.las).	rid7851.zip	meta7851.pdf	4/14/11
Ground Water Chemistry				
7900	**NC-GWE-PV-4, PV-5 and 33PA** Ground water chemistry results including major ions, nutrients, and metals from ACZ Laboratories, Inc.; SIRA of nitrogen in nitrate from Isotech Laboratory; and gross alpha and gross beta from Radiation Safety Engineering.	rid7900.zip	meta7900.pdf	5/6/11
GPS Location Data				
7838	Post-processed Global Positional System (GPS) positions for wells **NC-GWE-PV-4**, PV-5, 2P, 33PA, and Felderhoff-25-1-PA.	rid7838.pdf	meta7838.pdf	2/28/11

Abbreviations:

NAD 83 - North American Datum of 1983
AMSL - Above Mean Sea Level
BGL - Below Ground Level
BGS - Below Ground Surface
GPM - Gallons Per Minute
GWE - Groundwater Evaluation

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Water Resource Characterization and Monitoring

Water Resource Sustainability

Water Quality Protection

Resource Management

GWE Well Map

GWE Data Download

Well No. NC-GWE-PV-5

SITE SUMMARY AND DATA

Status: **Completed on 6/04/2010**

Latitude/Longitude (NAD 83) - Approximate:
36° 10' 40.17" N 116° 1' 34.79" W

Legal Description: **T20S R53E S28 SW 1/4**

Total Depth of Borehole (ft):	**200.0**
Total Depth of Well (ft):	**155.5**
Elevation of Ground Surface (ft amsl):	**2580.6**
Elevation of Water (ft amsl):	**2511.8**
Depth to Water (ft bgl):	**68.8**
Screened Interval (ft bgl):	**65-145**
Sandpack Depth (ft bgs):	**60-170**
Estimated Airlifted Water Production (gpm):	**15**
Alluvium Thickness (ft):	**1000**

(depth to water values based on post-drilling measurements taken in March 2011)

Contact Intervals (ft bgl)	Stratigraphic Unit
0-200	Lean Clay

Access: There are several access routes possible to NC-GWE-PV-5. The one shown is from the intersection of Nevada Highway 372 and Red Rock Drive heading south on Red Rock Drive about 1.7 miles. Turn left onto W. Calvada Blvd and proceed east about 0.6 miles. Take the second right onto Platense Street and drive south about 0.4 miles. The well NC-GWE-PV-5 will be on the right side of the road. Click on the thumbnail image for a larger view.

Purpose - Groundwater Conditions in Pahrump Valley:
NC-GWE-PV-5 is one of five boreholes and wells that were drilled to infill data gaps in the Water Level Monitoring Program (WLMP), especially on the Pahrump Fan.

Data:

RID	Description	Data	Metadata	Date
	Well Completion Diagrams			

7807.01	**NC-GWE-PV-5** Well Completion Diagram	rid7807_01.pdf	meta7807_01.pdf	6/06/11
Geophysical Data				
7782	**NC-GWE-PV-5** Open Hole Geophysical Logs, including: natural gamma, 8-, 16-, 32-, and 64-inch normal and lateral resistivity, fluid temperature, fluid resistivity, and caliper logs. Data collected on 6/03/10; Data are in log ASCII format (.las).	rid7782.zip	meta7782.pdf	10/11/10
7852	**NC-GWE-PV-5** Completion Geophysical Logs, including: natural gamma, 8-, 16-, 32-, and 64-inch normal and lateral resistivity, fluid temperature, fluid resistivity, and density logs. Data collected on 12/16/2010; Data are in log ASCII format (.las).	rid7852.zip	meta7852.pdf	4/14/11
Ground Water Chemistry				
7900	**NC-GWE-PV-4, PV-5 and 33PA** Ground water chemistry results including major ions, nutrients, and metals from ACZ Laboratories, Inc.; SIRA of nitrogen in nitrate from Isotech Laboratory; and gross alpha and gross beta from Radiation Safety Engineering.	rid7900.zip	meta7900.pdf	5/6/11
GPS Location Data				
7838	Post-processed Global Positional System (GPS) positions for wells NC-GWE-PV-4, **PV-5**, 2P, 33PA, and Felderhoff-25-1-PA.	rid7838.pdf	meta7838.pdf	2/28/11

Abbreviations:

NAD 83 - North American Datum of 1983
AMSL - Above Mean Sea Level
BGL - Below Ground Level
BGS - Below Ground Surface
GPM - Gallons Per Minute
GWE - Groundwater Evaluation

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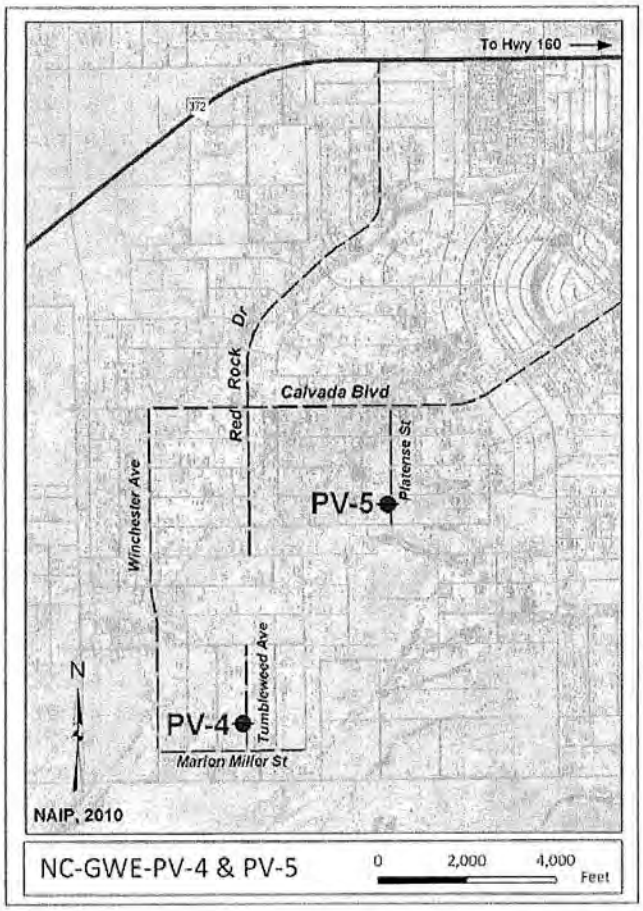
To Hwy 160
172
Red Rock Dr
Calvada Blvd
Platense St
PV-5
Winchester Ave
Tumbleweed Ave
N
PV-4
Marion Miller St
NAIP, 2010
NC-GWE-PV-4 & PV-5
0
2,000
4,000
Feet