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May 8, 2012

427930.DI.DR

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

Subject: Data Response, Set 1C-3
Hidden Hills Solar Electric Generating System (11-AFC-2)

Dear Mr. Monasmith:

On behalf of Hidden Hills Solar I, LLC; and Hidden Hills Solar II, LLC, please find attached a copy of Data Response Set 1C-3.

This data response set is being filed electronically. Please call me if you have any questions.

Sincerely,
CH2M HILL

John L. Carrier, J.D.
Program Manager

Encl.

c: POS List
Project file

Data Response 1C-3

Hidden Hills

Solar Electric Generating System

(11-AFC-2)

Application for Certification

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

May 2012

With Technical Assistance from

CH2MHILL®

IS061411043744SAC

Hidden Hills Solar Electric Generating System (HHSEGS)

(11-AFC-2)

Data Response, Set 1C-3
(Response to Data Requests 95-96)

Submitted to the

California Energy Commission

Submitted by

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

May 8, 2012

With Assistance from

CH2MHILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833

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Section Page

Attachments

Introduction

Attached is Hidden Hills Solar I, LLC, and Hidden Hills Solar II, LLC (collectively, "Applicant") response to the California Energy Commission (CEC) Staff's data request numbers 95 and 96 for the Hidden Hills Solar Electric Generating System (HHSEGS) Project (11-AFC-2). The CEC Staff served this data request on November 17, 2011, as part of the discovery process for HHSEGS.

Worker Safety and Fire Protection (95-96)

BACKGROUND

Hidden Hills SEGS will bring a large scale industrial facility into the jurisdiction of Southern Inyo Fire Protection District (SIFPD). First responder and fire protection services will be required for the project and will be provided by the unfunded and understaffed SIFPD. As the construction and operation of the project will increase the assets that the fire district must protect and potentially increase call frequency for emergency first aid and medical services, Energy Commission staff requires assurance that SIFPD's increased responsibility will not adversely affect its ability to continue providing service to the public.

DATA REQUESTS

95 Please provide a letter, email, or record of conversation with SIFPD that confirms the absence of any expected impacts on the local fire district resulting from construction and operation of the proposed project.

Response: Please see the response to Data Request 96 below.

96. In the absence of such letter or communication, please provide a Fire and Emergency Services Risk Assessment and a Fire Protection and Emergency Services Needs Assessment for the construction and operation of the project that provides an objective estimate of both equipment and staffing shortfalls (if any) and the associated recommended mitigations (if any) that would be required by SIFPD to maintain its current level of readiness to respond.

The Fire Risk Assessment and a Fire Protection Needs Assessment should be considerate of the guidance provided by NFPA 1720: Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Volunteer Fire Departments and NFPA 551: Guide for the Evaluation of Fire Risk Assessments. The Fire Protection and Emergency Services Needs Assessment should address emergency fire and medical response and equipment, staffing, and location needs while the Risk Assessment should be used to establish the risk (chances) of significant impacts occurring. The Fire Protection and Emergency Services Needs Assessment and Risk Assessment should evaluate the following: (a) the risk of impact on the local population that could result from potential unmitigated impacts on local fire protection and emergency services (i.e. "drawdown" of emergency response resources, extended response times, etc.) and (b) recommend an amount of funding that should be provided to mitigate any identified impacts on local fire protection and emergency medical response services.

Response: A Draft Fire and Emergency Services Risk Assessment for HHSEGS is provided in Attachment DR96-1. In addition, Attachment DR96-2 contains a Draft Fire Protection and Emergency Services Needs Assessment.

Attachment DR96-1
Fire and Emergency Services Risk Assessment

DRAFT

HIDDEN HILLS SOLAR ELECTRIC GENERATING SYSTEM

FIRE AND EMERGENCY SERVICES RISK ASSESSMENT

Prepared by:
Pacific Development Solutions Group

Contact:
Wesley Alston
(800) 385-4643

MAY 7, 2012

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1.0 SCOPE OF STUDY

The following provides a summary of the scope of work accomplished in order to prepare this document:

1. Review and understand the location, setting, and design as well as the construction activities and ongoing operation of the Hidden Hills Solar Electric Generating System (HHSEGS).

2. Define the applicable standards related to worker safety and health, fire protection, and emergency medical services.

3. Describe the fire protection systems for the HHSEGS and the safety and health programs defined by the Applicant in the Application for Certification (AFC). This includes programs related to hazardous materials, worker safety and health, fire protection, and emergency medical services to address hazards that could occur during construction and operation.

4. Review the potential for hazards to occur as a result of the construction and operation of the HHSEGS. This includes the potential for hazards related to the transport, use, and storage of hazardous materials, accidental release hazards, fire and explosion hazards, and other worker safety hazards.

5. Review the potential for hazards to occur in the area surrounding the HHSEGS site. This includes the potential effects that could occur on adjacent properties and vehicle-related accidents on the off-site roadways that would provide access during construction and operation.

6. Based on the identified potential hazards, compliance with the applicable standards, and the implementation of the fire protection systems and safety and health programs, define the risks related to the construction and operation of the HHSEGS that would require fire protection and emergency medical services.

2.0 PROJECT DESCRIPTION AND SETTING

2.1 LOCATION AND SETTING

The Hidden Hills Solar Electric Generating Systems (HHSEGS) project site is located on approximately 3,277 acres in the southeastern portion of unincorporated Inyo County, California, approximately 19 miles to the northeast of the community of Tecopa, California, approximately 18 miles south of the City of Pahrump, Nevada, and approximately 45 miles west of the City of Las Vegas, Nevada. The site is located on privately owned land along the California-Nevada border in Township 22 North, Range 10 East, Sections (or portions thereof) 15, 16, 20, 21, 22, 23, 26, 27, and 28. The HHSEGS project will use a transmission line and a natural gas pipeline (i.e., linear corridors) that will be located in Clark and Nye Counties, Nevada, primarily on federal land managed by the U.S. Bureau of Land Management (BLM), outside of the jurisdiction of the California Energy Commission (CEC). Therefore, this Risk Assessment does not address these linear corridors.

The area surrounding the project site is sparsely populated. The area to the south and east of the project site is mostly disturbed private land that has been partially developed for residential use. The area to the west and north is mostly undeveloped vacant land. The closest residence to any power block is located approximately 3,500 feet south of the power block for Solar Plant 2. The residence nearest to the project site's property boundary is approximately 300 feet east of the solar field. However, this residence is located farther away from the power block. The St. Therese Mission is a commercial development currently under construction on 17.5 acres approximately 0.5 mile to the southeast of the project site. On its completion, the development will provide a chapel, columbarium, garden, restaurant, visitor's center, playground, restrooms, and caretaker house. It is anticipated that the opening of the first phase will occur in July 2012.

The Front Sight Firearms Training Institute is located in Nevada approximately 1.7 miles north of the project site. This facility offers classes during both the day and nighttime hours, including nighttime courses using Uzi submachine guns and M16s. Death Valley National Park is located approximately 20 miles west of the project site.

Access to the project site is provided via Tecopa Road located to the east and south of the project site. State Route 160 (SR 160), located approximately 9 miles to the east of the project site in Nevada, is connected to the project site via Tecopa Road. Tecopa Road connects Nevada SR 160 to California State Route 127 (SR 127) located approximately 28 miles to the west of the project site. Regional access to the project area is provided via Interstate 15 (I-15) located approximately 37 miles to the southeast of the project site.

The project site is mostly vacant disturbed private land that has been previously graded for an abandoned residential subdivision. Although the project site does not contain federal land, it is bordered by BLM-managed land to the west, north, and east. The BLM

land is part of the California Desert Conservation Area and the Northern and Eastern Mojave Planning Area.

The topography of the project site slopes gently, with the highest point in the southeastern corner and the lowest point along the northwest boundary. Sandy alluvium extends onto the project site from the northeast and larger ephemeral washes enter the project site from the east near the California-Nevada state line. The climate at the project site is arid with extreme fluctuations in daily and seasonal temperatures. Rainfall mostly occurs from November through March with late summer rainfall (approximately 0.3 inch per month) a regular occurrence.

According to the California Department of Forestry and Fire Protection (CAL FIRE) 2008 Local Responsibility Fire Severity Maps, the project site is within a moderate fire hazard severity zone.

2.2 PROJECT CHARACTERISTICS

The HHSEGS will consist of two solar fields and associated facilities. The northern solar plant is Solar Plant 1 and the southern solar plant is Solar Plant 2. Each solar plant will generate 270 megawatts (MW) gross (250 MW net), for a total net output of 500 MW. Solar Plant 1 will occupy approximately 1,483 acres (or 2.3 square miles). Solar Plant 2 will occupy approximately 1,510 acres (or 2.4 square miles). A 103-acre common area will be provided on the southeastern corner of the site to accommodate an administration, warehouse, and maintenance complex. A temporary construction laydown and parking area occupying 180 acres will be provided on the west side of the site.

The following provides a description of the project elements of the HHSEGS.

2.2.1 Solar Plants

Each solar plant will use heliostats, which are elevated mirrors guided by a tracking system mounted on a pylon, to focus the sun's rays on a solar receiving steam generator (SRSG) on top of a 750-foot tall solar power tower near the center of each solar field. In each plant, one Rankine-cycle steam turbine will receive steam from the SRSG (or solar boiler) to generate electricity. The solar field and power generation equipment will start each morning after sunrise and will shut down when insolation drops below the level required to keep the turbine online.

To save water in the site's desert environment, each solar plant will use a dry-cooling condenser. Cooling will be provided by air-cooled condensers, supplemented by a partial dry-cooling system for auxiliary equipment cooling. Raw water will be drawn daily from onsite wells located in each power block and at the administration building. Groundwater will be treated in an onsite treatment system for use as boiler make-up water and to wash the heliostats. Auxiliary equipment at each plant includes feed water heaters, a deaerator, an emergency diesel generator, and a diesel fire pump.

Each of the power blocks will be connected via underground and overhead generation tie (gen-tie) lines to the switchyard. In addition, each power block will have a gas metering

set. Permanent parking areas will be provided at each power block for operations and maintenance personnel.

2.2.2 Common Area

A 103-acre common area will be established on the southeastern corner of the site to accommodate the following: an administration, warehouse, and maintenance complex; an onsite substation; an asphalt-paved visitor and employee parking area; and landscape areas. The administration complex will occupy approximately 4.8 acres and be served by power from the local 33-kilovolt (kV) distribution system and water from water supply wells located in the common area.

The common area will also be used for temporary construction parking areas, construction trailers, and other construction support facilities. The surface areas within the common area that are used for construction will be stabilized.

2.2.3 Temporary Construction Laydown Area

A 180-acre temporary construction laydown area on the west side of the site will be used for equipment laydown, construction parking, construction trailers, heliostat assembly buildings, and other construction support facilities. The surface areas within the temporary construction area that are used frequently will be stabilized.

2.2.4 Access Roads and Drive Zones

Project access will be from Tecopa Road to the project entrance road on the east side of the project site. Tecopa Road is an existing two-lane paved road. Secondary access will be from Tecopa Road along the west side of the project site and then along a paved road between the two solar plants.

The internal roadway and utility corridors for each heliostat field and its power block will contain a 20-foot-wide paved or hardscape access road from the entrance of the solar plant site to the power block, and then around the power block.

In addition to the paved or hardscaped 20-foot-wide access road to the power block of each solar plant, unpaved roads will radiate out from the power block to provide access through the solar field to the internal perimeter access road. Within the heliostat fields, 20-foot-wide "drive zones" will be located concentrically around the power block to provide access to the heliostat mirrors for maintenance and cleaning. The drive zones will be located approximately 152 feet apart, grubbed to remove vegetation, and smoothed. A 12-foot-wide unpaved path will be constructed on the inside perimeter of the project boundary fence for use by HHSEGS personnel to monitor and maintain perimeter security and the tortoise exclusion fencing. These paths will be grubbed, bladed, and smoothed to facilitate safe use.

2.3 GENERATING FACILITY DESIGN AND OPERATION

This following describes HHSEGS's conceptual design and proposed operation.

2.3.1 Process Description

In each solar project, one Rankine-cycle non-reheat steam turbine receives live steam from the SRSG located in the power block at the top of the solar power tower. The solar field and power generation equipment are started each morning after sunrise and insolation build-up and shut down when insolation drops below the level required to keep the turbine online.

Each solar plant includes one 249 MMBtu/hr natural gas-fired auxiliary boiler that will be used to pre-warm the SRSG and steam turbine generator piping before solar energy is available, minimizing the amount of time required for startup each morning, to assist during shutdown cooling operation, and to augment the solar operation during the evening shoulder period as solar energy diminishes. A small natural gas-fired preservation boiler will be used to maintain system temperatures overnight.

Power Cycle

Solar energy is reflected by the heliostats onto the SRSG where the energy heats water into superheated steam. The steam is the routed via the main steam pipe to the steam turbine generator (STG) where the steam's energy is converted to electrical energy.

The solar plant's power cycle is based on a Rankine-cycle turbine with three pressure stage casings. Primary thermal input is via an SRSG located at the top of the solar power tower. Live superheated steam enters a high pressure (HP) turbine casing at 2,466 pounds per square inch absolute (psia) and 1,085 degrees Fahrenheit (°F) (steam parameters are provided for Normal Continuous Rate).

Following expansion through the HP turbine, the steam is conveyed to the inlet of the intermediate pressure (IP) turbine. Steam enters the IP turbine at 535 psia and 666° F. Upon exiting the IP turbine, the steam travels via the crossover pipe to the inlet of the low pressure (LP) turbine. Steam enters the LP turbine at 78 psia and 310° F and exits at 1.6 psia or 3.25 inches of mercury into the air-cooled condenser.

Condensate is sent from the condenser well through four low-pressure feedwater heaters to the deaerator, which also serves for feedwater reserve storage and is the point of feedwater make-up injection. From the deaerator, high-pressure feedwater pumps send feedwater through three high pressure feedwater heaters and it is returned to the SRSG.

Major Facility Components

Electricity is produced by each solar plant's STG. The following describes the major components of the generating facility.

Solar Field

Each of the heliostat assemblies is composed of two mirrors, each approximately 12 feet high by 8.5 feet wide with a total reflecting surface of 204.7 square feet. Each heliostat assembly is mounted on a single pylon, along with a computer-programmed aiming control system that directs the motion of the heliostat to track the movement of the sun. Communication between the heliostats and the operations center will be done via surface-mounted anchored cable or wireless remote system. The solar field for each solar plant will consist of approximately 85,000 heliostats.

Solar Plants

The following provides further details regarding the two 270-MW solar plants.

- The solar power tower structure height is approximately 590 feet tall.
- The SRSG located at the top of the solar power tower is approximately 160 feet tall, resulting in an overall height of approximately 750 feet.
- No heliostat will be built closer than 394 feet from the solar power tower location.
- For Solar Plant 1, the distance between the solar power tower and the farthest heliostat in the solar field, approximately 7,660 feet, is in the northwest section of the heliostat array. For Solar Plant 2, the longest distance between the solar power tower and the farthest heliostat in the solar field, approximately 6,523 feet, is in the northeast section of the heliostat array. Generally, this is due to the higher efficiency of heliostat in the northern section in the northern hemisphere. With the sun predominantly in the southern sky, the cosine effect of incidence and reflection angles is less in the northern heliostats than in the southern ones. The converse (lower collection efficiency in the southern section) is also true, and, therefore, the maximum southern arc radius is the shortest.
- The eastern sector heliostat energy collection is more valuable than the western sector collection because afternoon energy collection, during on-peak utility hours, is more valuable than morning energy collection during part-peak or off-peak hours.

Steam Turbine Generator

The steam turbine system consists of a condensing STG with gland steam system, lubricating oil system, hydraulic control system, and steam admission/induction valving. HP steam from the SRSG superheater enters the HP steam turbine section through the inlet steam system. The steam expands through multiple stages of the turbine, driving the generator. On exiting the LP turbine, the steam is directed into their air-cooled condenser.

Natural Gas Boilers

Each solar plant will include two types of gas-fired boilers: the auxiliary boiler and the nighttime preservation boiler (described previously). The auxiliary boiler will have a capacity of 350,000 pounds per hour (lb/hr) at 950° F and 1,450 psia. The night preservation boiler will provide superheated steam to the STG and boiler feedwater pump gland systems overnight and during other shutdown periods when steam is not available from the SRSG. The night preservation boiler will produce 8,000 lb/hour at 680° F and 145 psia.

2.3.2 Major Electrical Equipment and Systems

The bulk of the electric power produced by the facility will be transmitted to the grid. A small amount of electric power will be used onsite to power auxiliaries such as pumps and fans, control systems, and general facility loads including lighting, heating, and air conditioning. Some power will also be converted from alternating current (AC) to direct current (DC) and stored in batteries, which will be used as backup power for the plant control systems and essential uses.

2.3.3 Fuel System

Natural gas supply for the HHSEGS will connect to the (Kern River Gas Transmission) KRGT pipeline approximately 35.3 miles southeast of the site. A tap station on the main KRGT transmission pipeline will be installed at this point. The new gas pipeline will proceed approximately 26 miles generally westward from the tap and enter the project site.

From the common area, an underground pipe will be installed along the northeastern border of the Solar Plant 2 solar field. At the road that divides the two solar fields, the pipeline will turn to the southwest and continue to the point where it intersects the road between the two solar plants. At this point, the pipeline will branch with one branch proceeding northwest to Solar Plant 1 and the other southeast to Solar Plant 2. Individual metering sets (including electrical preheaters for the natural gas, pressure-reduction equipment, and filter-separator skids) will be installed at each power block to monitor gas usage.

2.3.4 Water Supply and Use

The following describes the quantity of water required, the sources of the water supply, and water treatment methods.

Six onsite groundwater supply wells will be drilled and developed to provide raw water for the HHSEGS; two new wells per power block (primary and backup) and two wells at the administration complex. The wells will supply both solar plants and will be used for make-up water, mirror wash water, and domestic uses. The entire 500-MW net project will require up to 84.5 gallons per minute (gpm) (average) raw water make-up, with 30 to 50 gpm required by each plant, and 3.5 gpm (average) required for portable water use.

Each solar plant will have a raw water tank with a capacity of 250,000 gallons. A portion of the raw water (100,000 gallons) is for plant use while the majority will be reserved for fire water.

The HHSEGS will generate electricity up to 16 hours a day, with the exception of a scheduled shutdown in late December for maintenance. However, the water treatment plant will operate continuously in order to minimize water treatment system size and capital cost, and to use off-peak energy at night.

The onsite groundwater production wells will supply both solar plants and the administration complex with make-up water, mirror-wash water, and domestic water. Each solar plant will include a water treatment and deionizing facility in the power block area. The combined 500-MW net capacity of the solar plants will require an average of approximately 90 gpm. To provide adequate operating flexibility, 140 acre-feet per year (afy) of water is required for operations and 288 afy will be needed during construction.

2.4.4 Plant Cooling Systems

The cycle heat rejection system will consist of an air-cooled steam condenser system. The heat rejection system will receive exhaust steam from the low-pressure section of the steam turbine and feedwater heaters and condense it back to water for reuse. The condenser will be designed to normally operate at a pressure of about 3.2 inches of mercury absolute (0.11 millibar absolute). The condenser will remove heat from the condensing steam up to a maximum of 1,140 million British thermal units per hour (MMBtu/hr), depending on ambient temperature and plant load.

An auxiliary cooling system will cool the generator, steam turbine generator lubrication oil, boiler feed pump lubricating oil, SRSG circulating water pumps, and other equipment requiring cooling. A maximum of 34 MMBtu/hr will be rejected to the atmosphere via a fin-fan heat exchanger. Above 85° F, the fin-fan heat exchanger will be assisted by a wet surface air cooler using intermediate quality deionized water.

2.4.5 Waste Management

Waste Water Collection, Treatment, and Disposal

The primary wastewater collection system will collect and process wastewater from all of the solar plant equipment, including the boilers and water treatment equipment. To the extent practical, process wastewater will be recycled and reused. Each solar plant and the administration complex will include a septic tank and leach field system for sanitary water streams, including showers and toilet. When needed, septic tank contents will be removed from site by a sanitary service.

The following describes the wastewater collection, treatment, and disposal for the HHSEGS.

Plant Drains and Oil/Water Separator

General plant drains will collect containment area washdown, sample drains, and drainage from facility equipment drains. Water from these areas will be collected in a system of floor drains, hub drains, sumps, and piping and routed to the wastewater collection system. Drains that potentially could contain oil or grease will first be routed through an oil/water separator. Water from the process wastewater collection system will be returned back into the raw water storage tank. Water passing through the oil/water separator will be reduced in volume by the thermal evaporator, the reject from which will be trucked offsite for disposal.

Power Cycle Makeup Water Treatment Wastes

High quality deionized water from the high quality deionized water tank will be used as the feed water from the power-cycle makeup treatment system.

SRSG and Boiler Blowdown

SRSG and natural-gas-fired boiler blowdown will consist of boiler water discharged from the SRSG and five boilers to control the concentration of dissolved solids and silica within acceptable ranges. The blowdown will be discharged to flash tanks.

Steam from the flash tanks will be recovered back into the steam cycle via the deaerator. Condensate from the flash tanks will be further flashed to atmosphere then cooled and recycled to the raw water storage tank. As an alternative, blowdown may be discharged to the wastewater collection tank for treatment.

Solid Wastes

The HHSEGS will produce maintenance and plant wastes typical of power generation operations. Generation plant wastes may include oily rags, broken and rusted metal and machine parts, defective or broken electrical materials, empty containers, and other solid wastes, including the typical refuse generated by workers. Solid wastes will be trucked offsite for recycling or disposal.

Liquid Wastes

Waste lubrication oil will be recovered and recycled by a waste oil recycling contractor. Spent lubrication oil filters will be disposed of at an appropriate disposal facility. Workers will be trained to handle hazardous wastes generated at the project site.

Hazardous Wastes

Several methods will be used to properly manage and dispose of hazardous wastes generated by the HHSEGS. Chemical cleaning wastes will consist of alkaline and acid cleaning solutions used during pre-operational chemical cleaning of the boilers and acid cleaning solutions used for chemical cleaning of the boilers after the units are put into service. These wastes, which are subject to high metal concentrations, will be

temporarily stored onsite in portable tanks or sumps and disposed offsite by the chemical cleaning contractor in accordance with applicable regulatory requirements.

2.4.6 Management of Hazardous Materials

A variety of chemicals will be stored and used onsite during construction and operation. The storage, handling, and use of all chemicals will be conducted in accordance with applicable laws, ordinances, regulations, and standards (LORS) as defined in Section 3.0. Section 6.0 provides a description of the types, locations and quantities of hazardous material storage onsite. Chemicals will be stored in appropriate chemical storage facilities. Bulk chemicals will be stored in tanks and most other chemicals will be stored in returnable delivery containers. Chemical storage and chemical feed areas will be designed to contain leaks, spills, and stormwater. Concrete containment pits and drain piping design will allow a full-tank capacity spill without overflowing the containment. For multiple tanks located within the same containment area, the capacity of the largest single tank will determine the volume of the containment area and drain piping. Drain piping for reactive chemicals will be trapped and isolated from other drains to eliminate noxious or toxic vapors.

Safety showers and eyewashes will be provided adjacent to, or in the vicinity of, chemical storage and use areas. Plant personnel will use approved personal protective equipment during chemical spill containment and cleanup activities. Personnel will be properly trained in the handling of these chemicals and instructed in the procedures to follow in case of a chemical spill or accidental release. Adequate supplies of absorbant material will be stored onsite for spill cleanup.

2.4.7 Emission Control and Monitoring

Air emissions from the combustion of natural gas in the auxiliary-boilers at each plant will be controlled using appropriate air emission control devices. The boilers will be provided with ultra-low NO_x burners and flue gas recirculation to minimize NO_x emissions. Particulate emissions will be controlled by the use of best combustion practices, the use of natural gas, which is low in sulfur, as the sole fuel for the boilers, and high-efficiency air inlet filtration.

The auxiliary boilers and night preservation boiler will use predictive emissions monitoring in lieu of continuous monitoring of NO_x (40 CFR 48b(g)(2)), and will use the low mass emissions (LME) alternative to acid rain continuous emission monitoring system (CEMS) to comply with the monitoring requirements of Part 75.

2.5 SCHEDULE

2.5.1 Construction Schedule

The construction of the HHSEGS, from perimeter fencing to site preparation and grading to commercial operation, is expected to last approximately 29 months. Construction of Solar Plant 1 would begin first. However, construction of the common area facilities would occur concurrently with the construction of Solar Plant 1.

Onsite there will be an average and peak workforce of approximately 634 and 1,033, respectively, of construction craft people, supervisory, support, and construction management personnel during construction. The peak construction site workforce level is expected to occur in month 14.

Generally, construction activities will occur from 5:00 a.m. to 3:30 p.m. with a swing shift during heliostat assembly from 6:00 p.m. to 4:00 a.m. Additional hours may be necessary to make up schedule deficiencies, or to complete critical construction activities (e.g., tower construction, foundation pouring, or working around time-critical shutdowns and constraints). During some construction periods and during the startup phase of the project, some activities will continue 24 hours per day, 7 days per week.

2.5.2 Generating Facility Operation

Management, engineering, administration staff, skilled workers, and operators will serve both plans. The HHSEGS is expected to employ up to 120 full-time employees: 36 at Solar Plant 1 (including mirror washing machine operators); 36 at Solar Plant 2 (including mirror washing machine operators); and 48 at the administration complex. The facility will operate 7 days a week.

Detailed long-term maintenance schedules are currently unavailable, but will include periodic maintenance and overhauls in accordance with manufacturer recommendations. To maintain heliostat performance, nighttime labor demand includes an average 10 hours of mirror washing per day, covering the entire solar field every 2 weeks.

The HHSEGS is expected to have an annual plant availability of 92 to 98 percent. It will be possible for plant availability to exceed 98 percent for a given 12-month period.

The facility may be operated in one of the following modes:

- The facility would be operated at its maximum continuous output for as many hours per year as solar input allows; or
- A full shutdown will occur if forced by equipment malfunction, transmission or gas line disconnect, or scheduled maintenance.

3.0 APPLICABLE STANDARDS

The following provides a discussion of the laws, ordinances, regulations, and standards related to worker safety and health, fire protection, and emergency medical services that are applicable to the HHSEGS.

3.1 FEDERAL AND STATE LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following federal and state laws, ordinances, regulations, and standards (LORS) related to worker health and safety, fire protection services, and emergency medical services are applicable to the construction and ongoing operation of the HHSEGS:

Laws, Ordinances, Regulations, and Standards Applicable for Worker Safety and Health

LORS	Applicability
Federal	
Title 29 Code of Federal Regulations (CFR) Part 1910	Contains the minimum occupational safety and health standards for general industry in the United States
Title 29 CFR Part 1926	Contains the minimum occupational safety and health standards for the construction industry in the United States
State	
California Occupational Safety and Health Act, 1970	Establishes minimum safety and health standards for construction and general industry operations in California
8 California Code of Regulations (CCR) 339	Requires list of hazardous chemicals relating to the Hazardous Substance Information and Training Act
8 CCR 450	Addresses hazards associated with pressurized vessels
8 CCR 750	Addresses hazards associated with high-pressure steam
8 CCR 1509	Addresses requirements for construction, accident, and prevention plans
8 CCR 1509, et seq., and 1684, et seq.	Addresses construction hazards, including head, hand, and foot injuries and noise and electrical shock
8 CCR 1528, et seq., and 3380, et seq.	Requirements for personal protective equipment (PPE)
8 CCR 1597, et seq., and 1590, et seq.	Requirements for addressing the hazards associated with traffic accidents and earth-moving
8 CCR 1604, et seq.	Requirements for construction hoist equipment
8 CCR 1620, et seq., and 1723, et seq.	Addresses miscellaneous hazards

LORS	Applicability
8 CCR 1709, et seq.	Requirements for steel reinforcing, concrete pouring and structural steel erection operations
8 CCR 1920, et seq.	Requirements for fire protection systems
8 CCR 2300, et seq., and 2320, et seq.	Requirements for addressing low-voltage electrical hazards
8 CCR 2395, et seq.	Addresses electrical installation requirements
8 CCR 2700, et seq.	Addresses high-voltage electrical hazards
8 CCR 3200, et seq. and 5139, et seq.	Requirements for control of hazardous substances
8 CCR 3203, et seq.	Requirements for operational accident prevention programs
8 CCR 3270, et seq., and 3209, et seq.	Requirements for evacuation plans and procedures
8 CCR 3301, et seq.	Requirements for addressing miscellaneous hazards, including hot pipes, hot surfaces, compressed air systems, relief valves, enclosed areas containing flammable or hazardous materials, rotation equipment, pipelines and vehicle-loading dock operations
8 CCR 3360, et seq.	Addresses requirements for sanitary conditions
8 CCR 3511, et seq., and 3555, et seq.	Requirements for addressing hazards associated with stationary engines, compressors, and portable, pneumatic, and electrically powered tools
8 CCR 3649, et seq., and 3700, et seq.	Requirements for addressing hazards associated with field vehicles
8 CCR 3940, et seq.	Requirements for addressing hazards associated with power transmission, compressed air, and gas equipment
8 CCR 5109, et seq.	Requirements for addressing construction accident and prevention programs
8 CCR 5110, et seq.	Requirements for the implementation of an ergonomics program
8 CCR 5139, et seq.	Requirements for addressing hazards associated with welding, sandblasting, grinding, and spray-coating
8 CCR 5150, et seq.	Requirements for confined space entry
8 CCR 5160, et seq.	Requirements for addressing hot, flammable, poisonous, corrosive, and irritant substances
8 CCR 5192, et seq.	Requirements for conduction emergency response operations
8 CCR 5194, et seq.	Requirements for employee exposure to dusts, fumes, mists, vapors, and gases

LORS	Applicability
8 CCR 5405, et seq.; 5426, et seq.; 5465, et seq.; 5500, et seq.; 5521, et seq.; 5545, et seq.; 5554, et seq.; 5565, et seq.; 5583, et seq.; and 5606, et seq.	Requirements for flammable liquids, gases, and vapors
8 CCR 5583, et seq.	Requirements for design, construction, and installation of venting, diking, valving, and supports
8 CCR 6150, et seq.; 6151, et seq.; 6165, et seq.; 6170, et seq.; and 6175, et seq.	Provides fire protection requirements
24 CCR 3, et seq.	Incorporates current edition of Uniform Building Code
8 CCR, Part 6	Provides health and safety requirements for working with tanks and boilers
California Health and Safety Code Section 25500, et seq.	Requires that every new or modified facility that handles, treats, stores or disposes of more than the threshold quantity of any of the listed acutely hazardous materials prepare and maintain a Risk Management Plan (RMP)
California Health and Safety Code Section 25500 through 25541	Requires the preparation of a Hazardous Material Business Plan (HMBP) that details emergency response plans for a hazardous materials emergency at the facility

Laws, Ordinances, Regulations, and Standards Applicable to Hazardous Materials Handling

LORS	Applicability
Federal	
Title 29 Code of Federal Regulations (CFR) Part 1910, et seq. and Part 1926, et seq.	Requirements for equipment used to store and handle hazardous materials
Risk Management Plan (Title 40 CFR 68)	Requires facilities storing or handling significant amounts of acutely hazardous materials to prepare and submit Risk Management Plans
Title 49 CFR Parts 172, 173, and 179	Provides standards for labeling and packaging of hazardous materials during transportation
Section 302, EPCRA (Pub. L. 99-499, 42 USC 11022) Hazardous Chemical Reporting: Community Right-To-Know (40 CFR 370)	Requires one time notification if extremely hazardous substances are stored in excess of Threshold Planning Quantities (TPQs)
Section 304, EPCRA (Pub. L. 99-499, 42 USC 11002) Emergency Planning and Notification (40 CFR 355)	Requires notification when there is a release of hazardous material in excess of its Reportable Quantity (RQ)
Section 311, EPCRA (Pub. L. 99-499, 42 USC 11021) Hazardous Chemical Reporting: Community Right-To-Know (40 CFR 370)	Requires that either Material Safety Data Sheets (MSDSs) for all hazardous materials or a list of all hazardous materials be submitted to the State Emergency Response Commission (SERC), Local

LORS	Applicability
	Emergency Planning Committee (LEPC), and Inyo County Department of Environmental Services
Section 313, EPCRA (Pub. L. 99-499, 42 USC 11023) Toxic Chemical Release Reporting: Community Right-To-Know (40 CFR 372)	Requires annual reporting of releases of hazardous materials
Section 311, Clean Water Act (Pub. L. 92-500, 33 USC 1251, et seq.) Oil Pollution Prevention (40 CFR 112)	Requires preparation of a Spill Prevention Control and Countermeasure (SPCC) plan if oil is stored in a single aboveground storage tank with a capacity greater than 660 gallons or if the total petroleum storage (including ASTs, oil-filled equipment, and drums) is greater than 1,320 gallons The facility will have petroleum in excess of the aggregate volume of 1,320 gallons
Pipeline Safety Laws (49 USC 60101, et seq.) Hazardous Materials Transportation Laws (49 USC 5101, et seq.) Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards (49 CFR 192)	Specifies natural gas pipeline construction, safety, and transportation requirements
State	
Health and Safety Code, Section 25500, et seq. (HMBP)	Requires preparation of an Hazardous Material Business Plan (HMBP) if hazardous materials are handled or stored in excess of threshold quantities
Health and Safety Code, Section 25270 through 25270.13 (Aboveground Petroleum Storage Act)	Requires preparation of an SPCC plan if oil is stored in a single aboveground storage tank with a capacity greater than 660 gallons or if the total petroleum storage (including ASTs, oil-filled equipment, and drums) is greater than 1,320 gallons The facility will have petroleum in excess of the aggregate volume of 1,320 gallons
Health and Safety Code, Section 25249.5 through 25249.13 (Safe Drinking Water and Toxics Enforcement Act) (Proposition 65)	Requires warning to persons exposed to a list of carcinogenic and reproductive toxins and protection of drinking water from the same toxins
Health and Safety Code, Article 2, Chapter 6.95, Sections 25531 to 25541; California Code of Regulations (CCR) Title 19 (Public Safety), Division 2 (Office of Emergency Services), Chapter 4.5 (California Accidental Release Prevention Program)	Requires facilities storing or handling significant amounts of acutely hazardous materials to prepare and submit Risk Management Plans
California Public Utilities Commission (CPUC) General Oder Nos. 112-E and 58-A	Specify standards for gas service and construction of gas gathering, transmission, and distribution piping systems

3.2 NATIONAL CONSENSUS STANDARDS

The following national consensus standards related to worker health and safety, fire protection services, and emergency medical services are applicable to the construction and ongoing operation of the HHSEGS:

Applicable National Consensus Standards

LORS	Applicability
Uniform Fire Code, Article 80	Addresses the prevention, control, and mitigation of dangerous conditions related to storage, dispensing, use and handling of hazardous materials and information need by emergency response personnel
National Fire Protection Association (NFPA) 10, Standard for Portable Fire Extinguishers	Requirements for selection, placement, inspection, maintenance, and employee training for portable fire extinguishers
NFPA 11, Standard for Low-Expansion Foam and Combined Agent Systems	Requirements for installation, and use of low-expansion foam and combined –agent systems
NFPA 11A, Standard for Medium- and High-Expansion Foam Systems	Requirements for installation and use of medium- and high-expansion foam systems
NFPA 12, Standard on Carbon Dioxide Extinguishing Systems	Requirements for installation and use of carbon dioxide extinguishing systems
NFPA 13, Standard for Installation of Sprinkler Systems	Guidelines for selection and installation of fire sprinkler systems
NFPA 14, Standard for the Installation of Standpipe and Hose Systems	Guidelines for selection and installation of standpipe and hose systems
NFPA 15, Standard for Water Spray Fixed Systems	Guidelines for selection and installation of water fixed spray systems
NFPA 17, Standard for Dry Chemical Extinguishing Systems	Guidance for selection and use of dry chemical extinguishing systems
NFPA 20, Standard for the Installation of Centrifugal Fire Protection	Guidance for selection and installation of centrifugal fire pumps
NFPA 22, Standard for Water Tanks for Private Fire Protection	Requirements for water tanks for private fire prevention
NFPA 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances	Requirements for private fire services mains and their appurtenances
NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems	Requirements for the periodic inspection, testing, and maintenance of water-based fire protection systems, including land-based and marine applications
NFPA 30, Flammable and Combustible Liquid Code	Requirements for storage and use of flammable and combustible liquids
NFPA 37, Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines	Fire protection requirements for installation and use of combustion engines and gas turbines

LORS	Applicability
NFPA 50A, Standard for Gaseous Hydrogen Systems at Consumer Sites	Fire protection requirements for hydrogen systems
NFPA 54, National Fuel Gas Code	Fire protection requirements for use of fuel gases
NFPA 59A, Standard for the Storage and Handling of Liquefied Petroleum Gases	Requirements for storage and handling of liquefied petroleum gases
NFPA 68, Guide for Explosion Venting	Guidance in design of facilities for explosion venting
NFPA 70, National Electric Code	Guidance on safe selection and design, installation, maintenance, and construction of electrical systems
NFPA 70B, Recommended Practice for Electrical Equipment Maintenance	Guidance on electrical equipment maintenance
NFPA 70E, Standard for Electrical Safety Requirements for Employee Workplaces	Employee safety requirements for working with electrical equipment
NFPA 72, Standard for the Installation, Maintenance and Use of Local Protective Signaling Systems for Guard's Tour, Fire Alarm and Supervisory Service	Requirements for installation, maintenance, and use of local protective signaling systems
NFPA 75, Standard for the Protection of Electronic Computer/Data Processing Equipment	Requirements for fire protection systems used to protect computer systems
NFPA 80, Standard for Fire Doors and Windows	Requirements for fire doors and windows
NFPA 85, Boiler and Combustion Systems and Hazard Code	Requirements for boiler design, installation, operation, maintenance, and training
NFPA 90A, Standard for the Installation of Air Conditioning and Ventilation Systems	Requirements for installation of air conditioning and ventilating systems
NFPA 101, Code for Safety to Life from Fire in Buildings and Structures	Requirements for design of means of exiting the facility
NFPA 291, Recommended Practice for Fire Flow Testing and Marking of Hydrants	Guidelines for testing and marking of fire hydrants
NFPA 850, Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations	Requirements for fire protection in electric generating plants and alternative fuel electric generating plants
NFPA 1961, Standard for Fire Hose	Specifications for fire hose
NFPA 1962, Standard for the Care, Maintenance, and Use of Fire Hose Including Connections and Nozzles	Requirements for care, maintenance, and use of fire hose
NFPA 1963, Standard for Screw Threads and Gaskets for Fire Hose Connections	Specifications for fire hose connections
American National Standards Institute/American Society for Mechanical Engineers (ANSI/ASME), Boiler and Pressure Vessel Code	Specifications and requirements for pressure vessels
ANSI, B31.2, Fuel Gas Piping	Specifications and requirements for fuel gas piping

3.3 LOCAL STANDARDS

The Southern Inyo Fire Protection District (SIFPD) does not have a fire department master plan or response standards. In addition, the SIFPD does not reference the NFPA 1720 as their response standard.

4.0 FIRE PROTECTION SYSTEM

The fire protection system will be designed to protect personnel and limit property loss and plant downtime in the event of a fire. The system will be designed to limit the spread of any fire generated at the plant site to adjacent land to avoid igniting a wildland fire. The primary source of fire protection water will be the raw water storage tank.

An electric jockey pump and electric-motor-driven main fire pump will be provided to increase the water pressure in the plant fire main to a level required to serve all fire fighting systems. In addition, a back-up, diesel-engine-driven fire pump will be provided to pressurize the fire loop if the power supply to the electric-motor-driven main fire pump fails. A fire pump controller will be provided for each fire pump.

The fire pump will discharge to a dedicated underground firewater loop piping system. Normally, the jockey pump will maintain pressure in the firewater loop. Both the fire hydrants and the fixed suppression systems will be supplied from the firewater loop. Fixed fire suppression systems will be installed at determined fire risk areas such as the transformers and turbine lube oil equipment. Sprinkler systems will also be installed in the administration complex buildings and fire pump enclosure as required by National Fire Protection Association (NFPA) and local code requirements. Handheld fire extinguishers of the appropriate size and rating will be located in accordance with NFPA 10 throughout the facility. Onsite personnel will be trained in the use of fire protection equipment and will be the first responders to a fire and/or a medical emergency incident. Generator step-up transformers and other oil-filled transformers will be contained and provided with a fire protection system per NFPA 850.

Refer to Appendix B for the *HHSEGS Fire Protection Design Basis*.

5.0 SAFETY AND HEALTH PROGRAMS

5.1 CONSTRUCTION SAFETY AND HEALTH PROGRAMS

During the construction phase, the HHSEGS will include the implementation of the Safety and Health Programs listed below. Prior to the start of construction, detailed programs and plans will be provided to the CEC, the SIFPD, and other agencies as a Condition of Certification. They are as follows:

- Injury and Illness Prevention Program
  - Philosophy and safety commitment
  - Safety leadership and responsibilities
  - Accountability
  - Specific core safety processes (see Construction Safety Programs below)
  - Employee communication
  - Planning "job hazard analysis and pre-task"
  - Compliance with work rules and safe work practices
  - Measurement of compliance and effectiveness of prevention methods
  - Communication of performance and implementation of necessary improvements
  - Training and other communication requirements

- Fire Protection and Prevention Program
  - General requirements
  - Housekeeping and proper material storage
  - Employee alarm/communication system
  - Portable fire extinguishers
  - Fixed firefighting equipment
  - Fire control and containment
  - Flammable and combustible liquid storage
  - Use of flammable and combustible liquids
  - Dispensing and disposal of flammable liquids
  - Service and refueling areas
  - Training

- Personal Protective Equipment Program
  - Personal protective devices
  - Head protection
  - Eye/face protection
  - Body protection
  - Hand protection
  - Foot protection
  - Skin protection
  - Fall protection
  - High-voltage protection

Respiratory protection
Hearing protection
Hazard analysis
Training

- Emergency Action Program/Plan
  Emergency procedures for the protection of personnel, equipment, the environment, and materials:
  Fire and emergency reporting procedures
  Response actions for accidents involving personnel and or property
  Bomb threats
  Site assembly and emergency evacuation route procedures
  Natural disasters response

  Reporting and notification procedures for emergencies and contacts including offsite and local authorities:
  Alarm and communication services
  Spill response, prevention, and control action plan
  Emergency response equipment
  Emergency personnel (response team) responsibilities and notification roster
  Training requirements

- Construction Safety Programs
  - Motor Vehicle and Heavy Equipment Safety Program
    Operation and maintenance of vehicles
    Inspection
    Personal protective equipment
    Training
  - Forklift Operation Program
    Trained and certified operators
    Fueling operations
    Safe operating parameters
    Training
  - Excavation/Trenching Program
    Shoring, sloping, and benching requirements
    California Occupational Safety and Health Administration (CAL/OSHA) permit requirements
    Inspection
    Air monitoring
    Access and egress
  - Fall Protection Program
    Evaluation of fall hazards
    Protection devices
    Training
  - Scaffolding/Ladder Safety Program

  - Construction and inspection of equipment
  - Proper use
  - Training
- Articulating Boom Platforms Program
  - Inspection of equipment
  - Load ratings
  - Safe operating parameters
  - Training
- Crane and Material Handling Program
  - Certified and licensed operators
  - Inspection of equipment
  - Load ratings
  - Safe operating parameters
  - Training
- Hazardous Waste Program
  - Evaluation of hazard
  - Training
  - Air monitoring
  - Medical surveillance
  - Health and Safety Plan (HSP) preparation
- Hot Work Safety Program
  - Welding and cutting procedures
  - Fire watch
  - Hot work permit
  - PPE
  - Training
- Employee Exposure Monitoring Program
  - Exposure evaluation
  - Monitoring requirements
  - Reporting of results
  - Medical surveillance
  - Training
- Electrical Safety Program
  - Grounding procedure
  - Lock-out/tag-out (LO/TO) procedures
  - Overhead and underground utilities
  - Utility clearance
  - Training
- Permit-Required Confined-space Entry Program
  - Air monitoring and ventilation requirements
  - Rescue procedures
  - LO/TO and blocking, binding, and blanking requirements

Permit completion
Training

- Hand and Portable Power Tool Safety Program
  Guarding and proper operation
  Training
- Housekeeping and Material Handling and Storage Program
  Storage requirements
  Walkways and work surfaces
  Equipment handling requirements
  Training
- Hearing Conservation Program
  Identifying high-noise environments
  Exposure monitoring
  Medical surveillance requirements
  Hearing-protective devices
  Training
- Back Injury Prevention Program
  Proper lifting and material handling procedures
  Training
- Hazard Communication Program
  Labeling requirements
  Storage and handling
  Material Safety Data Sheets (MSDS)
  Chemical inventory
  Training
- Respiratory Protection Program
  Selection and use
  Storage
  Fit testing
  Medical requirements
  Inspection and repair
  Training
- Heat and Cold Stress Monitoring and Control Program
  Monitoring requirements
  Prevention and control
- Pressure Vessel and Pipeline Safety Program
  Line-breaking program
  Equipment inspection and maintenance
  Blocking, bleeding, and blanking
  Training

5.2 OPERATIONS SAFETY AND HEALTH PROGRAMS

After the completion of the construction phase and the commencement of the operation of the HHSEGS, the construction Safety and Health Programs will transition into an operation-oriented program reflecting the hazards and controls necessary. Detailed programs and plans will be submitted to the CEC, the SIFPD, and other agencies as a Condition of Certification. They are as follows:

- Injury and Illness Prevention Program
  - Personnel with the responsibility and authority for implementing the plan
  - Safety and health policy
  - Work rules and safe work practices
  - System for ensuring that employees comply with safe work practices
  - Employee communications
  - Identification and evaluation of workplace hazards

- Fire Protection and Prevention Program
  - General requirements
  - Fire hazard inventory, including ignition sources and mitigation
  - Housekeeping and proper materials storage
  - Employee alarm/communication system
  - Portable fire extinguishers
  - Fixed firefighting equipment
  - Fire control
  - Flammable and combustible liquid storage
  - Use of flammable and combustible liquid
  - Dispensing and disposal of liquids
  - Training
  - Personnel to contact for information on plan contents

- Emergency Action Program/Plan (Part of Risk Management Plan)
  - Emergency escape procedures and emergency escape route assignments
  - Procedures to be followed by employees who remain to operate critical plant operations before they evacuate
  - Procedures to account for all employees after emergency evacuation has been completed
  - Rescue and medical duties for those employees performing rescue and medical duties
  - Fire and emergency reporting procedures
  - Alarm and communication system
  - Personnel to contact for information on plan contents
  - Training requirements

- Personal Protective Equipment Program
  - Hazard analysis and prescription of Personal Protective Equipment
  - Personal protective devices

Head protection
Eye and face protection
Body protection
Hand protection
Foot protection
Skin protection
Sanitation
Safety belts and life lines for fall protection
Protection for electric shock
Medical services and first aid/blood borne pathogens
Respiratory protective equipment
Hearing protection
Training

- Plant Operation Safety Program
  - Motor Vehicle and Heavy Equipment Safety Program
    Operation and maintenance of vehicles
    Inspection
    Personal protective equipment
    Training
  - Forklift Operation Program
    Trained and certified operators
    Fueling operations
    Safe operating parameters
    Training
  - Excavation/Trenching Program
    Shoring, sloping, and benching requirements
    Cal-OSHA permit requirements
    Inspection
    Air monitoring
    Access and egress
  - Fall Protection Program
    Evaluation of fall hazards
    Protection devices
    Training
  - Scaffolding/Ladder Safety Program
    Construction and inspection of equipment
    Proper use
    Training
  - Articulating Boom Platforms Program
    Inspection of equipment
    Load ratings
    Safe operating parameters
    Operator training

- Crane and Material Handling Program
  - Certified and licensed operators
  - Inspection of equipment
  - Load ratings
  - Safe operating parameters
  - Training
- Hot Work Safety Program
  - Welding and cutting procedures
  - Fire watch
  - Hot work permit
  - Personal protective equipment
  - Training
- Workplace Ergonomics Program
  - Identification of personnel at risk
  - Evaluation of personnel
  - Workplace and job activity modifications
  - Training
- Employee Exposure Monitoring Program
  - Exposure evaluation
  - Monitoring requirements
  - Reporting of results
  - Medical surveillance
  - Training
- Electrical Safety Program
  - Grounding procedure
  - LO/TO procedures
  - Overhead and underground utilities
  - Utility clearance
  - Training
- Permit-Required Confined Space Entry Program
  - Air monitoring and ventilation requirements
  - Rescue procedures
  - LO/TO and blocking, blinding, and blanking requirements
  - Permit completion
  - Training
- Hand and Portable Power Tool Safety Program
  - Guarding and proper operation
  - Training
- Housekeeping and Material Handling and Storage Program
  - Storage requirements
  - Walkways and work surfaces
  - Equipment handling requirements
  - Training

- Hearing Conservation Program
  - Identifying high-noise environments
  - Exposure monitoring
  - Medical surveillance requirements
  - Hearing protective devices
  - Training
- Back Injury Prevention Program
  - Proper lifting and material handling procedures
  - Training
- Hazard Communication Program
  - Labeling requirements
  - Storage and handling
  - MSDS
  - Chemical inventory
  - Training
- Respiratory Protection Program
  - Selection and use
  - Storage
  - Fit testing
  - Medical requirements
  - Inspection and repair
  - Training
- Heat and Cold Stress Monitoring and Control Program
  - Monitoring requirements
  - Prevention and control
- Pressure Vessel and Pipeline Safety Program
  - Line-breaking policy
  - Equipment inspection and maintenance
  - Blocking, bleeding, and blanking
  - Communication
  - Training
- Safe Driving Program
  - Inspection and maintenance
  - Training

5.3 TRAINING PROGRAMS

5.3.1 Construction Training Program

The following summarizes the construction training program that will be implemented to ensure that employees recognize and understand how to protect themselves from potential hazards. The training will be delivered to the employees in various ways depending on the requirements of the California Occupational Safety and Health Administration (Cal-OSHA) standards, the complexity of the topic addressed, the characteristics of the workforce, and the degree of risk associated with each of the potential hazards.

Construction Training Program

Training Course	Target Employees
Injury and Illness Prevention Training	All employees
Emergency Action Program/Plan	All employees
Personal Protective Equipment Training	All employees
Motor Vehicle and Heavy Equipment Safety Training	Employees working on, near, or with heavy equipment or vehicles
Forklift Operation Training	Employees operating forklifts
Excavation/Trenching Safety Training	Employees involved with trenching or excavation
Fall Protection Training	Employees working at heights greater than 6 feet or required to use fall protection
Scaffolding/Ladder Safety Training	Employees required to erect or use scaffolding
Crane Safety Training	Employees supervising or performing crane operations
Fire Protection and Prevention Training	Employees responsible for the handling and storage of flammable or combustible liquids or gases
Hazard Communication Training	Employees handling or working with hazardous materials
Hazardous Waste	Employees handing or excavating hazardous waste
Hot Work Safety Training	Employees performing hot work
Fire Prevention and Protection Training	Employees performing hot work
Electrical Safety Training	Employees performing LO/TO or working on systems that require LO/TO activities
Electrical Safety Training	Employees required to work on electrical systems and equipment, or use electrical equipment and cords
Permit-Required Confined-Space Entry Training	Employees required to supervise or perform confined-space entry activities

Training Course	Target Employees
Hand and Portable Power Tool Safety Training	Employees that will be operating hand and portable power tools
Heat Stress and Cold Stress Safety Training	Employees that are exposed to temperature extremes
Hearing Conservation Training	All employees
Back Injury Prevention Training	All employees
Safe Driving Training	Employees supervising or diving motor vehicles
Pressure Vessel and Pipline Safety Training	Employees supervising or working on pressurized systems or equipment
Respiratory Protection Training	All employees required to wear respiratory protection
Fire Protection and Prevention Training	All employees

5.3.2 Operations Training Program

The following summarizes the operations training program that will be implemented to ensure that employees recognize and understand how to protect themselves from potential hazards. The training will be delivered to the employees in various ways depending on the requirements of the Cal-OSHA standards, the complexity of the topic addressed, the characteristics of the workforce, and the degree of risk associated with each of the potential hazards.

Operations Training Program

Training Course	Target Employees
Injury and Illness Prevention Training	All employees
Emergency Action Plan	All employees
Personal Protective Equipment Training	All employees
Excavation/Trenching Safety Training	Employees involved with trenching or excavating
Scaffolding/Ladder Safety Training	Employees required to erect or use scaffolding
Fall Protection Training	Employees required to use fall protection
Forklift Operator Training	Employees operating forklifts
Crane Safety Training	Employees supervising or performing crane operations
Workplace Ergonomics	Employees performing repetitive activities
Fire Protection and Prevention Training	Employees responsible for the handling and storage of flammable or combustible liquids or gasses
Hot Work Safety Training	Employees performing hot work

Training Course	Target Employees
Electrical Safety Training	Employees performing LO/TO
Electrical Safety	Employees required to work on electrical systems and equipment
Permit-Required Confined-space Entry	Employees required to supervise or perform confined-space entry
Hand and Portable Power Tool Safety Training	Employees that will be operating hand and portable power tools
Heat Stress and Cold Stress Safety Training	Employees exposed to temperature extremes
Hearing Conservation Training	All employees
Back Injury Prevention Training	All employees
Safe Driving Training	Employees supervising or driving motor vehicles
Hazard Communication Training	Employees handing or working around hazardous materials
Pressure Vessel and Pipeline Safety Training	Employees supervising or working on pressurized systems or equipment
Fire Protection and Prevention Training	All employees

6.0 HAZARDS OF THE PROJECT

The following provides a discussion of the potential hazards during construction and operation of the HHSEGS.

6.1 USE AND STORAGE OF HAZARDOUS MATERIALS

The HHSEGS would use and store hazardous materials during construction activities and ongoing operation. Table 6-1 provides a list of the hazardous materials to be used at the HHSEGS project site and their use and storage location. Table 6-2 provides information about these materials, including their: trade names; chemical names; Chemical Abstract Service (CAS) numbers; maximum quantities onsite; reportable quantities (RQs); threshold planning quantities (TPQs); and status as a Proposition 65 chemical (a chemical known to be carcinogenic or cause reproductive problems in humans). Some of the materials would be continuously stored on the project site, while others will be brought onsite for the initial startup and maintenance. Hazardous materials would not be stored or used in the gas supply line or electric transmission line corridors during operation of the solar plants.

The following discusses the use and storage of hazardous materials during construction and operation of the HHSEGS.

6.1 Construction Phase

The construction activities on the project site and within the linear corridors would use hazardous materials including gasoline, diesel fuel, motor oil, hydraulic fluid, solvents, cleaners, sealants, welding flux, various lubricants, paint, and paint thinner. The quantities of hazardous materials that would be onsite during construction would be limited. The transport, use, and storage of these materials would occur consistent with the applicable LORS defined in Section 3.0, Applicable Standards, and worker safety programs defined in Section 5.0, Safety and Health Programs, above. Refer to those sections of this document for the plans, programs, and guidelines to be implemented for the construction activities on the HHSEGS project site.

No regulated substances would be used during construction activities for the HHSEGS. The storage of hazardous materials would be contained in designated hazardous materials storage areas and their use would be carefully prescribed in terms of the defined hazardous materials handling plans, the Safety and Health Programs, and the Hazardous Materials Business Plan (HMBP) if required by the CEC. The construction contractor would be responsible for implementing Best Management Practices (BMPs) on the HHSEGS project site consistent with hazardous materials storage, handling, emergency spill response, and reporting specified in the HMBP.

TABLE 6-1
USE AND LOCATION OF HAZARDOUS MATERIALS DURING OPERATION

Chemical	Use	Storage Location	State	Storage Type
Nalco Elimin-OX (Oxygen scavenger)	Oxygen scavenger for boiler chemistry control and metal passivation	Power Block: Containers near power tower	Liquid	300-gallon totes Continuously onsite
Aqueous Ammonia (19% concentration)	pH control for boiler chemistry control	Power Block: Containers near power tower	Liquid	300-gallon totes Continuously onsite
Sulfuric Acid 93% (66° Baumé)	pH control	Power Block: Containers in water treatment building	Liquid	300-gallon totes Continuously onsite
Sulfuric Acid (Batteries)	Electrical power	Power Block: Contained within the main electrical room and the power tower; Common Area: Contained within main electrical room	Solid/Liquid	Batteries
Sodium Hydroxide (50% concentration)	pH control	Power Block: Containers in Water Treatment Building	Liquid	300-gallon totes Continuously onsite
Diesel Fuel (No. 2)	Emergency generator	Power Block: Near fire pump and beneath emergency diesel generator; Common Area: near fire pump, beneath emergency diesel generator, and adjacent to the mirror wash machines water filling station	Liquid	Aboveground storage tanks and in equipment Continuously onsite
Paint, solvents, adhesives, cleaners, sealants, lubricants	Equipment maintenance	Power Block: Maintenance Shop	Liquid	1-gal and 5-gal containers
Cleaning Chemicals and Detergents	Periodic cleaning of steam turbine	Power Block: Maintenance shop	Liquid	Miscellaneous manufacturer's containers Continuously onsite
Anti-scalant (Nalco 5200M or similar)	Wastewater treatment chemistry control	Power Block: Containers in water treatment building	Liquid	300-gallon totes Continuously onsite
Anti-foaming agent (Nalco 7468 or similar)	Wastewater treatment chemistry control	Power Block: Containers in water treatment building	Liquid	300 gallon totes Continuously onsite
Corrosion Inhibitor (Nalco 3DT-187 or similar)	WSAC corrosion chemistry control	Power Block: Containers in water treatment building	Liquid	300-gallon totes Continuously onsite

TABLE 6-1 (CONTINUED)
USE AND LOCATION OF HAZARDOUS MATERIALS DURING OPERATION

Chemical	Use	Storage Location	State	Storage Type
Dispersant (Nalco 73801WR or similar)	WSAC corrosion chemistry control	Power Block: Containers in water treatment building	Liquid	300-gallon totes Continuously onsite
Corrosion Inhibitor (Nalco TRAC107 or similar)	Closed cooling water chemistry control	Power Block: Containers in water treatment building	Liquid	55-gallon drums Continuously onsite
Sodium Bisulfite (30% $NaHSC_3$)	Dechlorination	Common Area: Containers in water treatment building	Liquid	300-gallon totes Continuously onsite
Lubricating Oil	Miscellaneous equipment lubrication	Power Block: Contained within equipment, drums during replacement; Common Area: Contained within equipment, spare capacity stored in maintenance shop	Liquid	Contained continuously within equipment, misc. drums during replacement
Mineral Transformer Insulating Oil	Provides overheating and insulation protection for transformers	Power Block: Contained within transformers; Common Area: Contained within transformers	Liquid	Contained continuously within transformers
Hydraulic Oil	Miscellaneous equipment control oil	Power Block: Contained within equipment, drums during replacement; Common Area: Contained within equipment, spare capacity stored in maintenance shop	Liquid	Contained continuously within equipment; misc. drums during replacement
Sodium Hypochlorite	Switchyard/switchgear devices	Contained within equipment	Gas	Continuously onsite

Source: Hidden Hills Solar Electric Generating System, Supplemental Data Response, Set 2 (Project Description and Visual Resources), submitted April 2, 2012.

Notes:
gal = gallon(s); WSAC = Wet-Surface Air Cooler

TABLE 6-2
HHSEGS CHEMICAL INVENTORY AT THE HHSEGS PROJECT SITE

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ[a]	RQ of Material as Used Onsite[b]	EHS TPQ[c]	Regulated Substance TQ[d]	Prop 65
Nalco Elimin-OX (or similar oxygen scavenger)	Carbohydrazide	497-18-7	1,200 gal	[e]	[e]	[e]	[e]	No
Aqueous Ammonia (19% concentration)	Ammonium hydroxide	1336-21-6	1,200 gal	1,000 lb	1,000 lb	500 lb	[e]	No
Acid	Sulfuric acid (93% - 66° Baumé	7664-93-9	1,200 gal	1,000 lb	1,075 lb	1,000 lb	[e]	No
Lead Acid Batteries	Composed of the following: Lead (45-60% of battery); Sulfuric acid (10-30% of battery)	7439-92-1 7664-93-9	420,000 lbm	10 lb	16 lb	[e]	[e]	Yes (lead)
Caustic	Sodium hydroxide	1310-73-2	1,200 gal	1,000 lb	2,000 lb	[e]	[e]	No
Diesel Fuel (No. 2)	Diesel fuel	None	34,000 gal	42 gal[f]	42 gal[f]	[e]	[e]	Yes
Cleaning Chemicals and Detergents	Various	None	2,500 gal	[e]	[e]	[e]	[e]	No
Wastewater Treatment System Anti-scalant	Nalco 5200M or similar	Proprietary	1,200 gal	[e]	[e]	[e]	[e]	No
Wastewater Treatment System Anti-foaming Agent	Nalco 7468 or similar	Proprietary	1,200 gal	[e]	[e]	[e]	[e]	Yes
WSAC Corrosion Inhibitor	Nalco 3DT-187 or similar (Phosphoric acid 5%)	7664-38-2	1,200 gal	5,000 lb	100,000 lb	[e]	[e]	No
WSAC Dispersant	Nalco 73801WR or similar	Proprietary	1,200 gal	[e]	[e]	[e]	[e]	No
Closed Cooling Water Corrosion Inhibitor	Nalco TRAC107 or similar	1310-73-2 & 1330-43-4	500 gal	1,000 lb	2,000 lb	[e]	[e]	No
Bisulfite	Sodium bisulfite 30%	7631-90-5	1,500 gal	5,000 lb	16,667 lb	[e]	[e]	No
Sodium Hypochlorite	Sodium hypochlorite 12% (trade)	7681-52-9	1,500 gal	100 lb	800 lb	[e]	[e]	No

TABLE 6-2 (CONTINUED)
HHSEGS CHEMICAL INVENTORY AT THE HHSEGS PROJECT SITE

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ[a]	RQ of Material as Used Onsite[b]	EHS TPQ[c]	Regulated Substance TQ[d]	Prop 65
Lubricating Oil	Oil	None	40,000 gal (does not include oil contained within individual equipment and reservoirs)	42 gal[f]	42 gal[f]	[e]	[e]	Yes
Mineral Transformer Insulating Oil	Oil	8012-95-1	100,000 gal	42 gal[f]	42 gal[f]	[e]	[e]	Yes
Hydraulic Oil	Various oil	None	5,000 gal (does not include oil contained within individual equipment and reservoirs)	42 gal[f]	42 gal[f]	[e]	[e]	No
Sulfur Hexafluoride	Sulfur hexafluoride	2551-62-4	1,300 lb	[e]	[e]	[e]	[e]	No

Source: Hidden Hills Solar Electric Generating System, Supplemental Data Response, Set 2 (Project Description and Visual Resources), submitted April 2, 2012.

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[a] Reportable quantity (RQ) for a pure chemical, per CERCLA [Ref. 40 CFR 302, Table 302.4]. Release equal to or greater than RQ must be reported. Under California law, any amount that has a realistic potential to adversely affect the environment or human health or safety must be reported.

[b] Reportable quantity for materials as used onsite. Since some of the hazardous materials are mixtures that contain only a percentage of a reportable chemical, the reportable quantity of the mixture can be different than for a pure chemical. For example, if a material only contains 10% of a reportable chemical and the RQ is 100 lb., the reportable quantity for that material would be (100 lb.)/(10%) = 1,000 lb.

[c] Threshold Planning Quantity (TPQ) [Ref. 40 CFR Part 355, Appendix A]. If quantities of extremely hazardous materials equal to or greater than TPQ are handled or stored, they must be registered with the local Administering Agency.

[d] TQ is Threshold Quantity from 19 CCR 2770.5 (state) or 40 CFR 68.130 (federal).

[e] No reporting requirement. Chemical has no listed threshold under this requirement.

[f] State reportable quantity for oil spills that will reach California state waters [Ref. CA Water Code Section 13272(f)].

The most likely potential hazardous incident that could occur during construction would involve the fuels, oils, and grease dripping from construction equipment. Construction personnel would be trained to handle the materials properly and the small quantities of fuel, oil, and grease that might drip from construction equipment would have relatively low toxicity. In addition, construction activities may result in small oil spills during onsite refueling of construction equipment. These potential spills from fueling operations would be limited to small areas of contaminated soil. If a fuel spill occurs on soil, the contaminated soil would be placed into barrels or trucks for offsite disposal as hazardous waste. As discussed above, the construction contractor would be responsible for implementing BMPs on the HHSEGS project site consistent with hazardous materials storage, handling, emergency spill response, and reporting specified in the HMBP. Therefore, the expected potential hazard from fuel, oil, and grease from construction equipment would be minimal and, therefore, less than significant.

The potential for hazards related to accidental releases, fires, or explosions to occur during construction of the HHSEGS due to hazardous materials is discussed below.

6.1. Operation Phase

The operation of the HHSEGS would require the use of the hazardous materials listed on Tables 6-1 and 6-2 at the power blocks for Solar 1 and Solar 2. Tables 6-1 and 6-2 provide a summary of the hazardous materials to be used and stored during operation of the HHSEGS based on the Title 22 CCR characteristics criteria and based on the properties of the substances themselves.

The transport, use, and storage of these materials would occur consistent with the applicable LORS defined in Section 3.0, Applicable Standards, and worker safety programs defined in Section 5.0, Safety and Health Programs, above. Refer to those sections of this document for the plans, programs, and guidelines to be implemented for the ongoing operations on the HHSEGS project site.

During the ongoing operation, most of the hazardous substances that would be use are required for facility maintenance and lubrication of equipment or would be contained in transformers and electrical switches. Their storage would be contained in designated hazardous materials storage areas and their use would be carefully prescribed in terms of the defined hazardous materials handling plans, the Safety and Health Programs, and the HMBP. If a spill or release of hazardous materials should occur, the spill area would be bermed or controlled as quickly as practical to minimize the footprint of the area affected. The potentially contaminated soil and materials would be placed into drums for offsite disposal as hazardous waste. If a spill or leak into the environment involves hazardous materials equal to or greater than the specific reportable quantity, the federal, state, and local reporting requirements will be adhered to during the cleanup activities. The Project Owner would be responsible for verifying that the use, storage, and handling of hazardous materials during operations are in compliance with the applicable LORS. This would include the implementation of BMPs consistent with hazardous materials handling, emergency spill response, and reports as specified in the HMBP. Therefore,

the expected potential hazard to employees or the environment during operation would be very low and, therefore, less than significant.

The potential for hazards related to accidental releases, fires, or explosions to occur during ongoing operation of the HHSEGS due to hazardous materials is discussed below.

6.2 ACCIDENTIAL RELEASE HAZARDS

The California Fire Code, Articles 79 and 80, includes specific requirements for the safe storage and handling of hazardous materials that would reduce the potential for a release or for the mixing of incompatible materials. The design of the HHSEGS provides for chemical storage and handling facilities in compliance with the current California Fire Code and other applicable LORS. Upon compliance with these requirements, hazards related to accidental release of hazardous materials would be less than significant.

6.3 FIRE AND EXPLOSION HAZARDS

The California Fire Code, Article 80, requires that all hazardous materials storage areas to be equipped with a fire extinguishing system and requires ventilation for all enclosed hazardous material storage areas. Some flammable substances would be used and stored on the project site; Diesel No. 2 and lubrication oil. These substances are discussed below.

Diesel No. 2 would be used as fuel for emergency and fire generators and fire pumps. In addition, diesel would be used as a motor fuel consistent with motor fueling standards. Appropriate fire protection measures would be installed with the diesel tanks to prevent spills, fires, and explosions. With proper storage and handling in compliance with the California Fire Code and the HMBP, hazards related to fire and explosion as a result of diesel would be less than significant.

Lubrication oil would be used for the plant machinery. In accordance with the California Fire Code, Article 80, the storage area for the lubrication oil would be equipped with a fire extinguishing system and the lubrication oil would be handled in accordance with the HMBP. With proper storage and handling in compliance with the California Fire Code and the HMBP, hazards related to fire and explosion as a result of lubrication oil would be less than significant.

Hydraulic oil and Acrylate Terploymer (Gengard GN7004) are classified as combustible and mineral insulating oil is classified as having the potential to be combustible, depending on the manufacturer. With proper storage and handling in compliance with the California Fire Code and the HMBP, hazards related to fire and explosion as a result these materials would be less than significant.

Natural gas would be used as fuel for the auxiliary boilers at each power block for the solar plants. There is the potential for a hazard to occur if there is a leak in the supply

line that brings the natural gas from the KRGT line. Since the gas line would be newly constructed to meet the current standards of pipeline design and construction, the potential for leakage would be less than that of an older pipeline. Therefore, hazards related to fire and explosion as a result of the natural gas line to serve the auxiliary boilers would be less than significant.

6.4 OTHER WORKER SAFETY HAZARDS

During construction activities, ongoing daily operations and maintenance, and annual maintenance of the solar power tower, the power generation equipment, and other components of the HHSEGS, there would be the potential for other hazards to worker safety related to a technical rescue situation. The solar power tower structure is 590 feet tall and topped by a 160-foot tall solar receiving steam generator (SRSG), resulting in an overall height of approximately 750 feet. The tower would have stairs, an elevator, and hoist system that could be used in an emergency event.

All construction, operation, and maintenance on the HHSEGS project site would occur in compliance with the California Department of Safety and Health (CAL/OSHA) Standards Part 1910, Occupational Safety and Health Administration Safety and Health Regulations. Due to the height of the tower and the confined space in the interior, the daily operations and maintenance personnel for the solar power tower and other project components with potential technical rescue conditions would have training based on federal and state standards and equipment manufacturer's requirements. Major maintenance activity for the solar power tower, including the exterior of the tower and the SRSG as well as other project components with potential technical rescue conditions, would occur on an annual basis by a contractor with personnel that would have training based on federal and state standards and equipment manufacturer's requirements. Upon compliance with CAL/OSHA Standards Part 1910 and the use of contractors and/or employees with the appropriate training, other hazards related to worker safety during construction, operation, and maintenance would be less than significant.

6.5 OFF-SITE VEHICLE ACCIDENTS

During construction activities and ongoing operation of the HHSEGS, there would be the potential for vehicle hazards with injuries to occur on the roadways in the vicinity of the HHSEGS project site. The following describes the surrounding roadway system and access to the project site.

The primary regional transportation corridors within the project area include Interstate 15 (I-15), Nevada State Route 160 (NSR160), and California State Route 127 (CSR 127). The project area is primarily served by NSR 160 and local streets, including Tecopa Road that serves the project site. Although the HHSGS would be located in California, due to the location of the project site adjacent to the California-Nevada border, it is anticipated that the majority of the employees and construction workers would access the project site by way of the NSR 160/Tecopa Road intersection in Nevada.

The following provides a description of the roadways that would serve the project area.

Tecopa Road (also known as Old Spanish Trail Highway) is a two-lane north-south arterial approximately 39 miles long connecting CSR 127 to the south and NSR 160 to the north. Tecopa Road borders the HHSEGS project site on the southeast and will be used by all construction traffic and operations traffic to access the project site. The majority of the project traffic will travel through the Tecopa Road/NSR 160 intersection to access the regional road network.

CSR 127 (Death Valley Road) is a two-lane highway and the closest major facility to the project site that feeds into I-15 to the south. CSR 127 begins at I-15 in the community of Baker, California, and continues northwest along the eastern edge of Silver Lake and portions of Death Valley National Park. CSR 127 intersects Tecopa Road approximately 50 miles north of I-15. North of Tecopa Road, CSR 127 continues along the eastern edge of Death Valley and ends at the California-Nevada border where Nevada State Route 373 (NSR 373) begins.

NSR 160 is an east-west highway that connects the southern Las Vegas Valley to U.S. Route 95 northwest of Las Vegas via the Pahrump Valley. NSR 160 is called Blue Diamond Road within the Las Vegas area and the Pahrump Valley Highway for the remainder of the route.

I-15 is located to the southeast of the project area and crosses into Nevada approximately 37 miles southeast of the project site. I-15 is the fourth longest north-south interstate highway that travels through the states of California, Nevada, Arizona, Utah, Idaho, and Montana and serves as a long-haul route for North American commerce. I-15 provides a regional connect between southern California and Las Vegas, providing a key route for tourism access to Las Vegas. In addition, I-15 is experiencing regional commuter traffic due to the growth in the Mojave Desert communities of Hesperia and Barstow.

To provide an evaluation of the potential hazard for off-site vehicle accidents, the accident rates on Tecopa Road were determined based on historical data obtained from the California Department of Transportation (Caltrans) and the Statewide Integrated Traffic Records System that compiles incidents reported by the California Highway Patrol. Table 6-3 provides a summary of all accidents reported to the California Department of Highway Patrol (CHP) and the corresponding accident rates for the years 2009, 2010, and 2011 that occurred on the Inyo County roadways in the vicinity of the project site.

TABLE 6-3
ACCIDENTS (INJURY AND NON-INJURY) ON ROADWAYS IN INYO COUNTY WITHIN VICINITY OF THE HHSEGS PROJECT SITE

Roadway Link	Existing ADT	No. of Reported Accidents			Highest No. of Accidents Over Period	Accident Rate[1]
		2008	2009	2010		
Tecopa Road west to CSR 127	200	4	3	0	4	0.020
CSR 127 south to county line	200	1	3	0	3	0.015

Source: Hidden Hills Solar Electric Generating System, Application for Certification, filed August 5, 2011 and Statewide Integrated Traffic Records System, Data Run Date March 28, 2012

[1] Gross number of accidents per ADT per year for each roadway link, based on the highest number of accidents during 2008-2010 divided by the existing ADT.

TABLE 6-4
POTENTIAL ADDITIONAL ACCIDENTS (INJURY AND NON-INJURY) ON ROADWAYS IN INYO COUNTY WITHIN VICINITY OF THE HHSEGS PROJECT SITE

Roadway Link	Existing ADT	Additional ADT Due to Project		Accident Rate[1]	Potential Additional Accidents	
		During Construction	During Operation		During Construction	During Operation
Tecopa Road west to CSR 127	200	137	10	0.020	2.74	0.40
CSR 127 south to county line	200	137	10	0.015	2.05	0.15

Source: Hidden Hills Solar Electric Generating System, Application for Certification, filed August 5, 2011 and Statewide Integrated Traffic Records System, Data Run Date March 28, 2012

[1] Gross number of accidents per ADT per year for each roadway.

Utilizing the estimated accident rates and the additional traffic that would be added to these roadways as a result of the HHSEGS, the potential accidents that could occur during the construction and ongoing operation of the HHSEGS were estimated. Table 6-4 provides an estimate of the accidents (injury and non-injury) that could occur on the Inyo County roadways in the vicinity of the project site with the additional traffic generated by the proposed project.

As indicated in Table 6-4, with the additional average daily trips generated by worker traffic during the construction phase of the HHSEGS and accident rate data, there is the potential for five additional vehicle accidents to occur per year on the surrounding roadways in Inyo County. An accident with injuries may require a response from the SIFPD. In addition, during the ongoing operation of the HHSEGS, there is a minimal anticipated increase in vehicle accidents on the surrounding roadways in Inyo County. Therefore, hazards to worker safety due to off-site vehicle accidents on the roadways in the project vicinity would be less than significant.

7.0 CONCLUSIONS RELATED TO RISKS OF THE PROJECT

Based on the identified potential hazards, compliance with the applicable standards, and the implementation of the fire protection systems and safety and health programs, the risks as a result of the construction activities and operation of the HHSEGS that would require fire protection and emergency medical services have been summarized in table below.

Hazard	Level of Risk
Use and storage of hazardous materials during construction	Extremely low
Use and storage of hazardous materials during operation and maintenance	Extremely low
Accidental release of hazardous materials	Extremely low
Fire or explosion from hazardous materials	Extremely low
Fire from use of natural gas	Extremely low
Worker safety related to height of tower during construction, operation, and maintenance	Extremely low
Worker safety related to work in confined spaces during construction, operation, and maintenance	Extremely low
Worker safety related to height of tower during construction, operation and maintenance	Extremely low
Offsite vehicle accidents	Extremely low

Source: Pacific Development Solutions Group, March 28, 2012

The potential levels of risk are: high, moderate, low, extremely low, remote, and extremely remote.

Appendix A

MAPS AND SITE PLAN

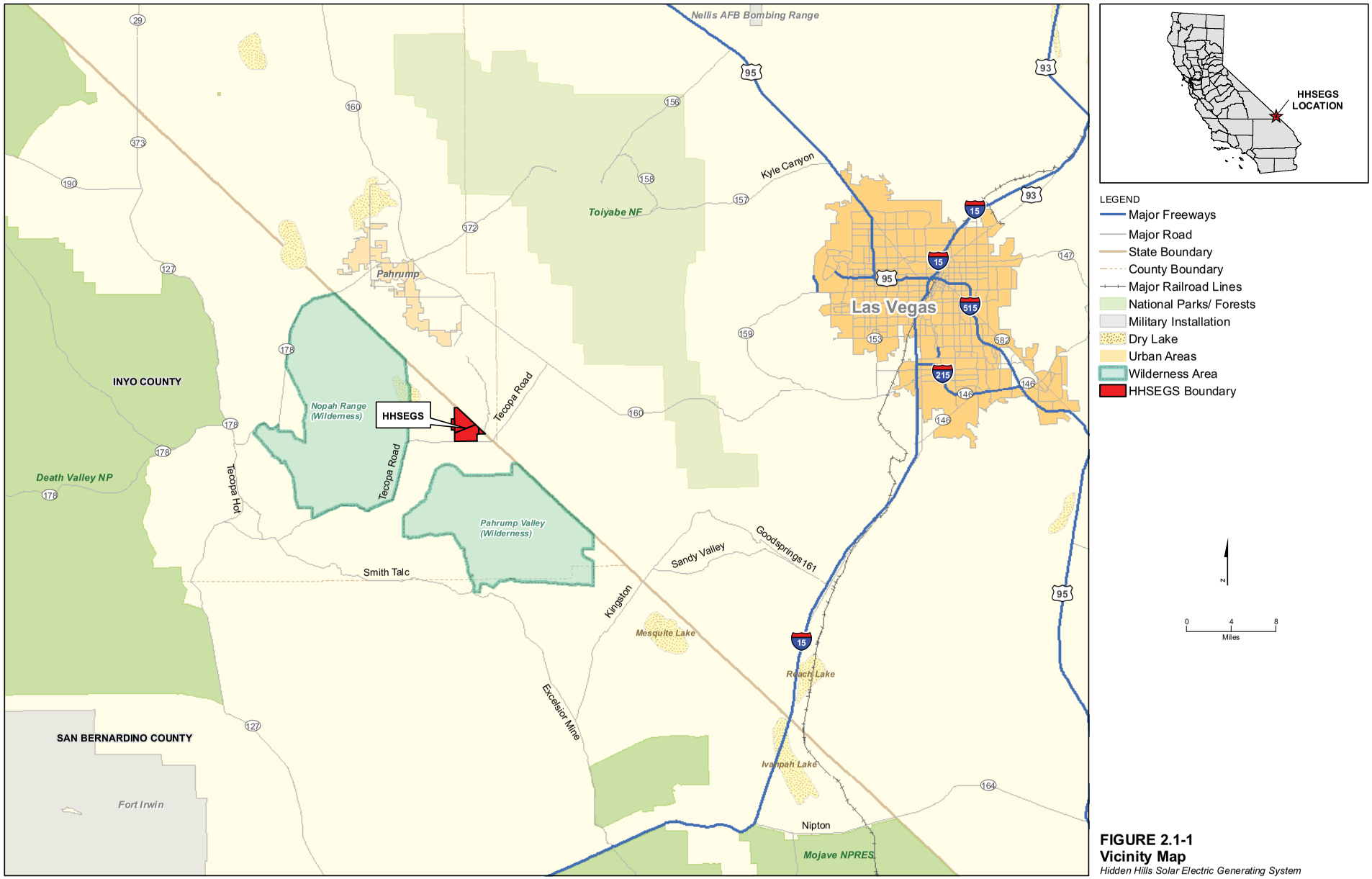
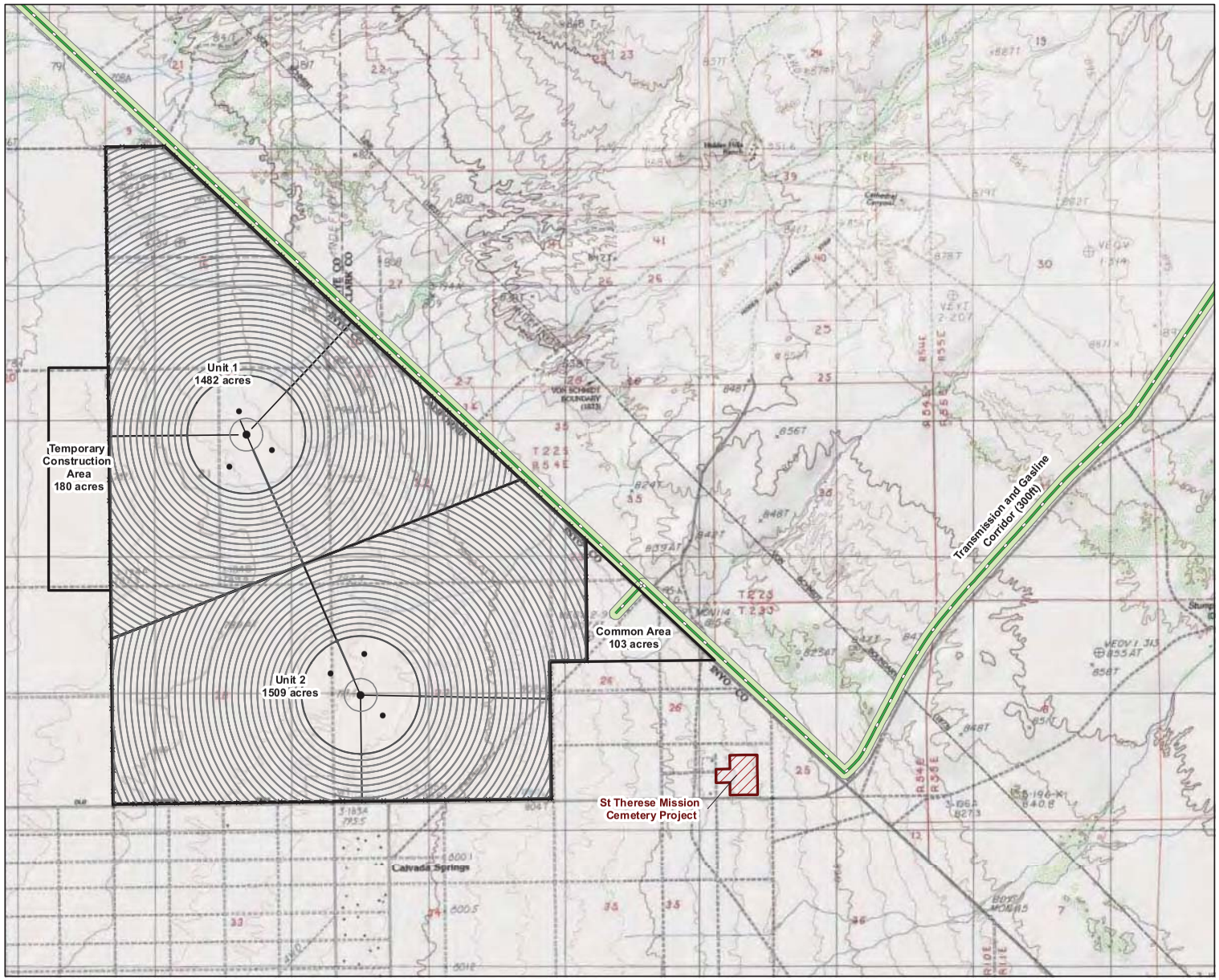


FIGURE 2.1-1
Vicinity Map
Hidden Hills Solar Electric Generating System



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

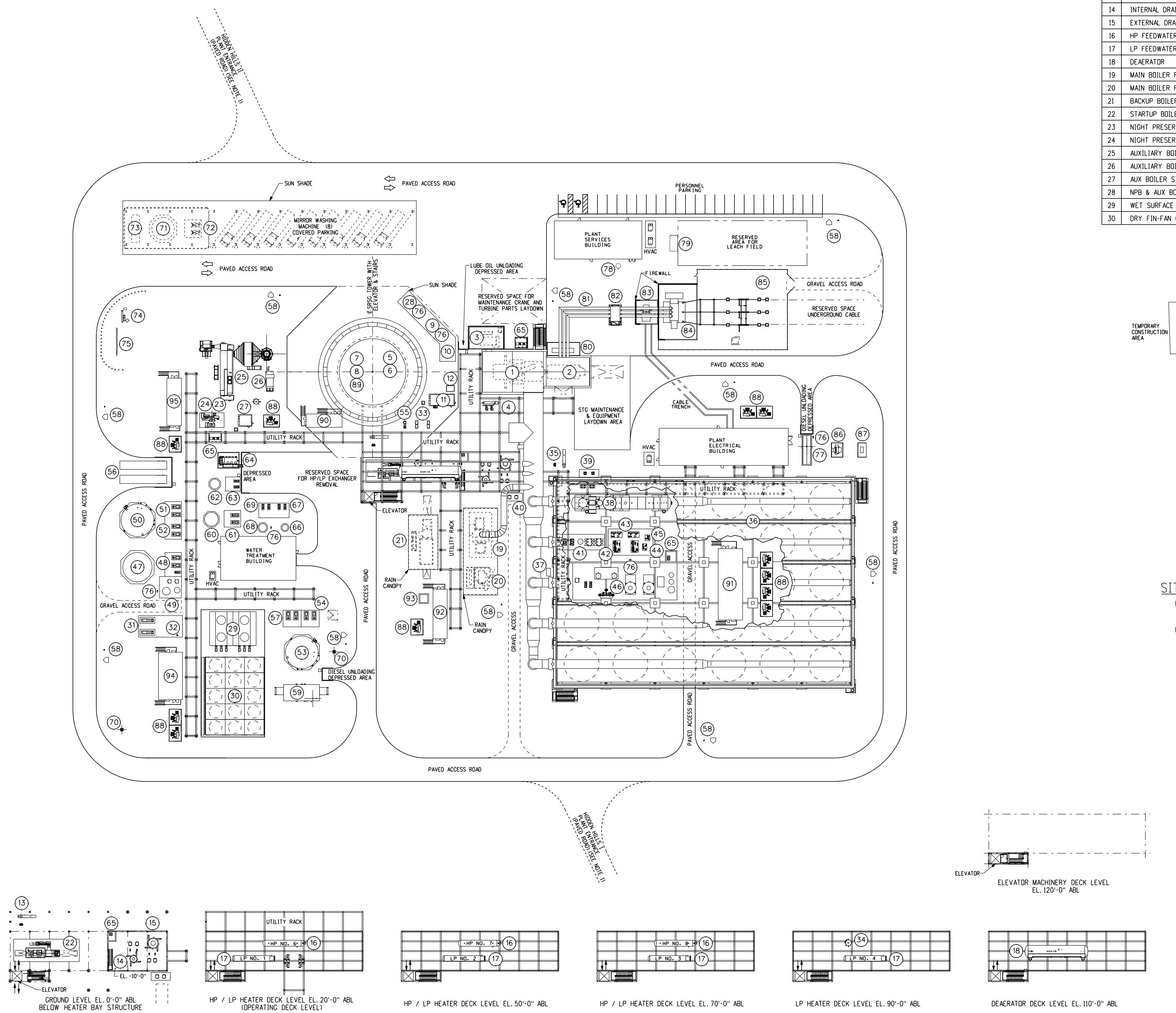
0 1,200 2,400
Feet

Figure 1
Hidden Hills Site and Propsed Transmission Lines
Hidden Hills

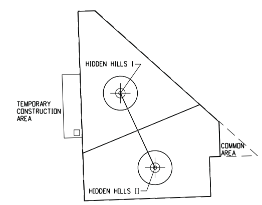
NA_FORMATS.CEL AC-ESTD_NA 1/11/12

NOTES:

1. POWER BLOCK ARRANGEMENT FOR HIDDEN HILLS I AND II TO BE IDENTICAL WITH THE EXCEPTION OF PLANT ENTRANCE AND RADIAL DIRT ROAD LOCATIONS. SEE APROPRIATE CIVIL DRAWINGS.



ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	STEAM TURBINE	31	CLOSED COOLING WATER (CCW) PUMPS (2)
2	GENERATOR	32	CCW CHEMICAL ADDITION TANK
3	LUBE OIL UNIT	33	CCW BOOSTER PUMPS (2)
4	GLAND STEAM CONDENSER	34	CCW HEAD TANK
5	SOLAR RECEIVER STEAM GENERATOR (SRSG)	35	BLOWDOWN / CONDENSATE HEAT EXCHANGER
6	BOILER CIRCULATION PUMPS (4) (SRSG)	36	AIR COOLED CONDENSER (ACC)
7	SRSG FLASH TANK (TOWER)	37	ACC WASH WATER SYSTEM SKID
8	SRSG BLOWDOWN TANK (TOWER)	38	CONDENSATE COLLECTION TANK
9	SRSG CHEMICAL FEED EQUIPMENT	39	CONDENSATE PUMPS (2)
10	NITROGEN STORAGE	40	STEAM DUCT DRAIN PUMPS (2)
11	SRSG STEAM & WATER ANALYSIS SAMPLING SYSTEM (SWAS)	41	PLANT AIR EQUIPMENT
12	BYPASS VALVE HYDRAULIC SKID	42	CONDENSER VACUUM PUMPS (2)
13	SRSG BLOWDOWN COOLER	43	CONDENSER VACUUM PUMPS FIN FAN COOLERS (2)
14	INTERNAL DRAIN TANK & PUMPS (2)	44	NIGHT TIME VACUUM PUMP
15	EXTERNAL DRAIN TANK & PUMPS (2)	45	NIGHT TIME VACUUM PUMP FIN FAN COOLER
16	HP FEEDWATER HEATERS (3)	46	CONDENSATE POLISHER EQUIPMENT
17	LP FEEDWATER HEATERS (4)	47	DEMINERALIZED WATER STORAGE TANK
18	DEAERATOR	48	DEMINERALIZED WATER TRANSFER PUMPS (2)
19	MAIN BOILER FEEDWATER PUMP (TURBINE DRIVEN)	49	DEMINERALIZER SYSTEM EQUIPMENT
20	MAIN BOILER FEEDWATER PUMP L.O. PACKAGE	50	TREATED WATER STORAGE TANK
21	BACKUP BOILER FEEDWATER PUMP (MOTOR DRIVEN)	51	TREATED WATER TRANSFER PUMPS (2)
22	STARTUP BOILER FEEDWATER PUMP (MOTOR DRIVEN)	52	DEMINERALIZER FEED PUMPS (2)
23	NIGHT PRESERVATION BOILER (NPB)	53	SERVICE / FIRE WATER STORAGE TANK
24	NIGHT PRESERVATION BOILER FEEDWATER PUMPS (2)	54	SERVICE WATER TRANSFER PUMPS (2)
25	AUXILIARY BOILER	55	SERVICE WATER BOOSTER PUMP (1)
26	AUXILIARY BOILER FEEDWATER PUMPS (2)	56	RAW WATER TREATMENT TRAILERS (2)
27	AUX BOILER STEAM & WATER ANALYSIS SAMPLING SYSTEM (SWAS)	57	RAW WATER TREATMENT FEED PUMPS (2)
28	NPB & AUX BOILER CHEMICAL FEED EQUIPMENT	58	FIRE HYDRANT & HOSE HOUSE (10)
29	WET SURFACE AIR COOLER (WSAC)	59	FIRE PUMPS MODULE (ELECTRIC, DIESEL & JOCKEY)
30	DRY FIN-FAN COOLERS	60	WASTEWATER COLLECTION TANK
		61	WASTEWATER FEED PUMPS (2)
		62	WASTEWATER RESIDUE TANK
		63	WASTEWATER RESIDUE PUMPS (2)
		64	OILY WATER SEPARATOR
		65	SUMP PUMPS
		66	POTABLE WATER STORAGE TANK
		67	POTABLE WATER SUPPLY PUMPS (2)
		68	POTABLE WATER TREATMENT SYSTEM FEED TANK
		69	POTABLE WATER FEED PUMPS (2)
		70	WELL PUMP (2)
		71	MIRROR WASH WATER STORAGE TANK
		72	MIRROR WASH WATER FILLING PUMPS (2)
		73	DIESEL FUEL STORAGE TANK
		74	FUEL GAS FILTRATION/HEATING EQUIPMENT
		75	FUEL GAS PIG RECEIVER / LAUNCHER (BY SUBCONTRACTOR)
		76	EMERGENCY EYEWASH & SHOWER
		77	EMERGENCY DIESEL GENERATOR
		78	SANITARY LIFT STATION (UNDERGROUND)
		79	SEPTIC TANK & LEACH FIELD
		80	EXCITATION CONTAINER
		81	ISOPHASE BUS DUCT
		82	GENERATOR CIRCUIT BREAKER
		83	UNIT AUXILIARY TRANSFORMER
		84	GENERATOR STEP-UP TRANSFORMER
		85	230KV PLANT SUB-STATION
		86	STATION SERVICE TRANSFORMER
		87	24.9kV BREAKER
		88	MCC OIL FILLED TRANSFORMER (11)
		89	ELECTRICAL EQUIPMENT MODULE FOR SRSG (TOWER)
		90	ELECTRICAL EQUIPMENT MODULE FOR SRSG
		91	ELECTRICAL EQUIPMENT MODULE FOR ACC
		92	ELECTRICAL EQUIPMENT MODULE FOR BFP
		93	LIQUID TO AIR REMOTE HEAT EXCHANGER (VFD)
		94	ELECTRICAL EQUIPMENT MODULE FOR FIN FAN/WSAC & WATER TREATMENT AREA
		95	ELECTRICAL EQUIPMENT MODULE FOR AUXILIARY BOILER



KEY PLAN

TRUE NORTH

PLANT NORTH

SITE LOCATION & ROTATION

HIDDEN HILLS I
TOWER LOCATION: N. 99,052.05 E. 30,426.00
ROTATION: 0° CLOCKWISE

HIDDEN HILLS II
TOWER LOCATION: N. 92,842.05 E. 33,310.00
ROTATION: 0° CLOCKWISE

PRELIMINARY

NO.	DATE	REVISIONS	BY	CHK	DES SUPV	ENGR	PROJ ENGR	APPR
A		ISSUED FOR INFORMATION	AKS					

SCALE AS SHOWN DATE 09SEP11 DESIGNED AKS DRAWN AKS CHIEF ENGR.

CBO/AHJ APPROVAL

BECHTEL POWER CORP.
DEDICATED TO SAFETY EXCELLENCE - ZERO ACCIDENTS
FREDERICK, MARYLAND

HIDDEN HILLS
SOLAR ELECTRIC GENERATING SYSTEM

TYPICAL POWER BLOCK
PLOT PLAN

JOB NO.	DRAWING NO.	REV.
25750	000-P1-0010-00001	A

PE STAMP

34"X44"E SIZE

Appendix B

HIDDEN HILLS SOLAR ENERGY GENERATING SYSTEM
FIRE PROTECTION DESIGN BASIS

HIDDEN HILLS Solar Electric Generating Facility (HHSEGS)

Fire Protection Design Basis

The HHSEGS consists of two 250 MW (nominal) Power Plants and one Common Area. Each Power Plant and Common Area will have a fire water storage tank and fire pumps to supply the fire water loop that supplies the yard hydrants, hose stations, water spray, and sprinkler systems. The system will be designed to supply the design water demand for automatic suppression systems plus flow for fire hydrants and hose stations in accordance with California Building Code (CBC 2010)/NFPA requirements.

1.0 WATER SUPPLY

Each service/fire water storage tank (Power Plant) and fire water storage tank (Common Area) will include a 2-hour dedicated fire water capacity. The suction piping for service water demand will be taken from above the 2-hour storage volume reserved for fire protection water at the bottom of the tank. Two main, one-hundred percent capacity, fire water pumps (one electric-motor driven and one diesel-engine driven) and a jockey pump to maintain system pressure will be provided at each Power Plant and Common Area. The fire pumps will take suction from the service/fire water storage tank. Automatic start for the fire pumps will be initiated by a pressure switch in accordance with CBC (2010)/NFPA practice. Once started, the fire pump(s) will continue to run until manually stopped at the associated local pump controller. Fire pumps will be sized to provide the design water demand to the automatic fire suppression system plus 500 gpm for a fire hydrant or hose station.

The underground fire main headers will be high-density polyethylene (HDPE) pipe and will loop around their respective Power Plant and Common Area, with service main branch lines to auxiliary structures and facilities as necessary. The main headers will serve yard hydrants and hose stations. Fire hydrants will be spaced at approximately 250-foot intervals around the fire loop. Fire hydrants will be located in accordance with NFPA 24 and local fire codes. The hydrants will be dry barrel type and include threaded outlet connections to match local fire department hose threads. Applicable hydrants, valving, and other appurtenances required by state and local codes will be included. Fire hose houses and hoses will be provided. Each hose house shall be equipped with 200-feet of 1 ½ inch hose and accessories per CBC (2010)/NFPA 24.

The fire water distribution system will incorporate sectionalizing valves so that a single failure in the respective yard loop piping (other than the supply piping) will not affect service to both suppression systems and yard hydrants serving the same area. The fire water distribution system will incorporate isolation valves so that the automatic suppression system can be taken out of service without affecting standpipes/hose stations serving the same area. Valves requiring periodic testing will be accessible. Valves will be arranged and installed in accordance with NFPA 24 and NFPA 13 requirements, as applicable. The valves will be administratively supervised/inspected in accordance with NFPA 25. Fire protection system piping will be hydrostatically tested in accordance with NFPA requirements.

2.0 FIRE PUMP HOUSE

The fire pumps will be skid mounted in a structural steel metal enclosure complete with all furnished equipment, piping, valves, controllers, panels, lights (interior, exterior and emergency), receptacles, etc. on a single enclosed, prewired and fabricated skid complete with heating, ventilation (with dust louvers on intake) and lighting etc designed to permit a single lift during transit and installation on the foundation. The enclosure will have a rated fire wall separating the diesel and electric fire pumps.

3.0 CODES AND STANDARDS

The fire protection shall be in accordance with generally accepted fire protection engineering practices and consistent with previously approved approaches to fire protection for other power plants throughout the US. This design approach will require local and/or state review and approval and may require code clarifications or design variances where general code requirements exceed typical industry design practice for power generating facilities.

The fire protection system will be provided in accordance with code requirements to mitigate fire hazards, reduce potential property loss and protect personnel, as approved by the authority having jurisdiction (AHJ). The fire protection system design generally will conform to NFPA 850 provisions and recommendations, except for the following:

- ♦ Section 4.5, Fire Protection Design Basis Document - A fire risk evaluation will be performed as part of the design development. A formal fire risk evaluation document will not be issued (unless required by Chief Building Official (CBO)).
- ♦ Section 5.1.1, Fire Area Determination - Detailed drawings showing plant fire areas and fire boundaries will not be issued (unless required by CBO).
- ♦ Section 5.1.1.4, Fire Barriers - In general, spatial separation will be provided for fire hazards. Fire-rated barriers will be provided only in a limited number of locations where physical separation cannot be achieved (e.g., transformer fire walls or walls separating office areas from fire hazards, fire pump house).
- ♦ Section 5.1.5, Indoor Transformers - All indoor transformers will be the dry type and less than 35 kV rating. Therefore, rated fire barriers or suppression systems will be not required for this equipment.
- ♦ Section 5.4.1.2.2, Heat Vents - The boiler does not require smoke/heat venting. The turbine enclosure roof will have fusible-link-operated smoke/heat vents only if provided by the STG Supplier.
- ♦ Section 5.4.1.3, Smoke Vents - Dedicated smoke venting systems are not required in plant control rooms or switchgear rooms due to their small size.
- ♦ Section 5.5.2, Drainage and Curbing - Oil-filled equipment, containers, and tanks will be curbed. A floor trench will be installed on the lowest level of such containment. The trench will be sized to accommodate the entire volume of oil contained in such equipment, containers, or tanks and sprinkler discharge.
- ♦ Section 7.7.2, Hydraulic Control System - The steam turbine will use a fire-resistant hydraulic fluid. Therefore, automatic fire suppression system coverage is not required for this equipment.

♦ Section 7.7.3.1, Turbine Lubricating Oil Systems - Listed fire-resistant lubricating oils are not available for steam turbines in this size range. Since the lubricating oil is flammable, an automatic suppression system will be provided to cover the areas below the turbine operating floor that are subject to oil flow for all areas containing oil piping and for 20 feet beyond the piping.

♦ Section 7.7.3.4, Turbine Lubricating Oil Curbing - See clarification for Section 5.5.2.

♦ Section 7.7.3.8, Lubricating Oil Pumps - The lube oil pump skid will be covered by an automatic suppression system. It is not feasible to separate or protect electrical cabling for the ac and dc oil pumps since they will be located on the same pump skid.

♦ Section 7.8.2, Cable Tunnels - Cable tunnels will not be used. There may be some cable pits beneath electrical equipment rooms. Cable within these areas will have fire-retardant insulation.

♦ Section 7.8.3.3, Electrical Cables - It is not practical to provide automatic suppression systems or fire-retardant coatings for electrical cable trays. Cable trays will be routed to avoid ignition sources or flammable liquids where possible. Medium and low voltage cable entering buildings will have flame-retardant insulation meeting the requirements of the IEEE-383 vertical flame test.

Sprinkler and fixed spray systems will be designed and installed in accordance with NFPA 13 and NFPA 15, respectively.

NFPA codes and standards listed in the CBC (2010) will be used (NFPA 10,13,14,15,16,20,22,24,30,37,72, 80, 85 and 2001), plus the following:

NFPA 45	Standard on Fire Protection for Laboratories Using Chemicals
NFPA 55	Compressed Gases and Cryogenic Fluids Code
NFPA 69	Standard on Explosion Prevention Systems
NFPA 75	Standard for the Protection of Information Technology Equipment
NFPA 496	Standard for Purged and Pressurized Enclosures for Electrical Equipment
NFPA 497	Recommended Practice For the Classification of Flammable Liquids, Gases, or Vapors, and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas
NFPA 780	Standard for the Installation of Lightning Protection Systems
NFPA 850	Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations
NFPA 1961	Standard on Fire Hose
NFPA 1963	Standard for Fire Hose Connections
NFPA 1964	Standard for Spray Nozzles

4.0 FIRE PROTECTION

Automatic and manual fire protection systems will be provided as necessary for protection in the event of a fire. The fire protection system will incorporate a fire alarm system with means to automatically or manually detect and suppress fires until they can be extinguished by qualified onsite or offsite personnel.

4.1 SUPPRESSION AND DETECTION SYSTEMS

Sprinkler and fixed spray systems will be designed and installed in accordance with CBC (2010)/NFPA. Fire protection systems for the Power Plant will be provided as stated in the table below.

Fire Protection Systems for Each Power Plant

	Automatic Suppression					**Manual**				**Alarm System**
Area Receiving Fire Protection	**Wet Pipe**	**Water Deluge**	**Gaseous System**	**Foam Deluge**	**Foam Preaction**	**Portable Extinguisher**	**Standpipe**	**Yard Hydrant**	**Pull Station**	**Fire Detection**
STG bearings					X					X
STG enclosure				X		X		X	X	X
STG lube oil reservoir				X				X		X
Boiler Feedwater Pump Turbine (BFPT) lube oil reservoir				X				X		X
Control room and control equipment room in Plant Services building *(Note)*			X			X		X	X	X
Plant electrical building			X			X		X	X	X
Electrical equipment module (PDC)						X		X	X	X
Main and auxiliary transformers		X						X	X	X
Station service transformer								X		X
ACC/MCC transformers								X		X
Solar tower and SRSG						X				X
Fire pump house	X							X		X
Water treatment building	X					X		X	X	X

Note: Clean Agent Fire Suppression Systems will be provided for control equipment and control rooms in the Plant Services building and the electrical rooms of the plant electrical building and the water treatment building. The systems should consist of, but not limited to, the agent, agent storage containers, agent release valves, fire detectors, fire detection system (wiring control panel, actuation signaling), agent delivery piping and agent dispersion nozzles.

Fire protection systems for the Common Area will be provided as stated in the table below.

Common Area Fire Protection Systems

	Automatic Suppression					Manual				Alarm System
Area Receiving Fire Protection	**Wet Pipe**	**Water Deluge**	**Gaseous System**	**Foam Deluge**	**Foam Preaction**	**Portable Extinguisher**	**Standpipe**	**Yard Hydrant**	**Pull Station**	**Fire Detection**
Admin/control building -maintenance/ warehouse areas	X					X		X	X	X
Admin/control building -central control room, control equipment room, battery room, and electrical room *(Note)*			X			X		X	X	X
Admin/control building -other offices only	X					X		X	X	X
MCC transformers								X		X
Fire pump house	X							X		X
Water treatment building (except for electrical room)	X					X		X	X	X
Water treatment building electrical room (*Note)*			X			X		X	X	X
Heliostat assembly building	X					X		X	X	X
Mirror Wash Machine (MWM) maintenance shed						X		X		
Switchyard control Electrical Equipment Module (EEM)						X		X	X	X

Note: Clean Agent Fire Suppression Systems will be provided for control equipment and control rooms in the Admin/Control building, and the electrical rooms of the water treatment building. The systems should consist of, but not limited to, the agent, agent storage containers, agent release valves, fire detectors, fire detection system (wiring control panel, actuation signaling), agent delivery piping and agent dispersion nozzles.

Augmenting the fixed fire protection system, portable fire extinguishers will be located throughout the Power Plant and Common Area. These extinguishers will be sized, rated, and spaced in accordance with CBC (2010)/NFPA. A 100-pound wheeled handcart CO_2 extinguisher will be provided in the turbine area.

A proprietary, addressable, smoke and fire detection system will be provided for the project, with local structure fire alarms, automatic fire detectors, and fire signaling panels as required by design codes and in accordance with CBC (2010)/NFPA. The main fire panel will be located in the Common Area central control room (CCR) and will be connected to the Power Plant local control room (LCR) panels. The LCR fire panel will have non-redundant communication with the distributed control system (DCS) and, if applicable, hardwired shutdown signals to the Emergency Shutdown (ESD) System. A DCS gateway will be provided to interface with the Fire Alarm Panel, with the main electrical distribution systems and process systems located at the common area and packaged equipment of the common area.

4.2 FIRE BARRIERS, FIRE PROOFING AND FIRE SEALS

The CBC occupancy use group of the Services Building and Electrical Building in each Plant and the Admin/Control Building in the Common Area are considered to be Factory Industrial (F-1). The structure will consist of Type II, nonrated, unprotected construction. Other than the walls surrounding the LCR, the CCR, the control equipment rooms, IT/ media room, oil storage rooms (if any), cable pits, battery room, solar tower stair enclosure, and electrical room, no other fire walls or structural steel fireproofing will be included.

Wherever possible, through-barrier penetrations in fire barriers will have commercially available rated closure systems or seals. Barrier penetrations having design characteristics exceeding the limits of commercially available qualified closure systems or seals will have closure systems or seals that use materials similar to qualified configurations. Alternatively, the barrier and penetration design will be evaluated and qualified by engineering judgment.

Concrete transformer firewalls will be provided between oil-filled transformers and adjacent structures and equipment as required by NFPA 850. Firewall partitions will be provided between adjacent transformers and where required to protect structures within 50 feet of the generator step-up (GSU) transformer.

Fire separation walls and floors will be provided in accordance with code requirements. Fire doors and frames will conform to CBC (2010)/NFPA for the class of door furnished.

Attachment DR96-2
Fire Protection and Emergency Services Needs Assessment

DRAFT

HIDDEN HILLS SOLAR ELECTRIC GENERATING SYSTEM

FIRE PROTECTION AND EMERGENCY SERVICES NEEDS ASSESSMENT

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MAY 7, 2012

TABLE OF CONTENTS

1.0 SCOPE OF STUDY

The following provides a summary of the scope of work accomplished in order to prepare this document:

1. Review and understand the location, setting, and design as well as the construction activities and ongoing operation of the Hidden Hills Solar Electric Generating System (HHSEGS).

2. Define the applicable standards related to worker safety and health, fire protection, and emergency medical services.

3. Describe the fire protection systems for the HHSEGS and the safety and health programs defined by the Applicant in the Application for Certification (AFC). This includes programs related to hazardous materials, worker safety and health, fire protection, and emergency medical services to address hazards that could occur during construction and operation.

4. Identify the existing fire department resources and emergency medical services resources. Evaluate the fire department and emergency medical services resources available to respond to emergency situations taking into account their existing staffing, equipment, response times, and workload.

5. Based on the potential hazards identified in the HHSEGS Fire and Emergency Services Risk Assessment (including compliance with the applicable standards, and the implementation of the fire protection systems and safety and health programs), analyze the impact to fire protection and emergency medical services resources during the construction activities and ongoing operation of the HHSEGS.

6. Provide recommendations that address identified impacts to fire protection and emergency medical services resources during the construction activities and ongoing operation of the HHSEGS.

2.0 PROJECT DESCRIPTION AND SETTING

2.1 LOCATION AND SETTING

The Hidden Hills Solar Electric Generating Systems (HHSEGS) project site is located on approximately 3,277 acres in the southeastern portion of unincorporated Inyo County, California, approximately 19 miles to the northeast of the community of Tecopa, California, approximately 18 miles south of the City of Pahrump, Nevada, and approximately 45 miles west of the City of Las Vegas, Nevada. The site is located on privately owned land along the California-Nevada border in Township 22 North, Range 10 East, Sections (or portions thereof) 15, 16, 20, 21, 22, 23, 26, 27, and 28. The HHSEGS project will use a transmission line and a natural gas pipeline (i.e., linear corridors) that will be located in Clark and Nye Counties, Nevada, primarily on federal land managed by the U.S. Bureau of Land Management (BLM), outside of the jurisdiction of the California Energy Commission (CEC). Therefore, this Risk Assessment does not address these linear corridors.

The area surrounding the project site is sparsely populated. The area to the south and east of the project site is mostly disturbed private land that has been partially developed for residential use. The area to the west and north is mostly undeveloped vacant land. The closest residence to any power block is located approximately 3,500 feet south of the power block for Solar Plant 2. The residence nearest to the project site's property boundary is approximately 300 feet east of the solar field. However, this residence is located farther away from the power block. The St. Therese Mission is a commercial development currently under construction on 17.5 acres approximately 0.5 mile to the southeast of the project site. On its completion, the development will provide a chapel, columbarium, garden, restaurant, visitor's center, playground, restrooms, and caretaker house. It is anticipated that the opening of the first phase will occur in July 2012.

The Front Sight Firearms Training Institute is located in Nevada approximately 1.7 miles north of the project site. This facility offers classes during both the day and nighttime hours, including nighttime courses using Uzi submachine guns and M16s. Death Valley National Park is located approximately 20 miles west of the project site.

Access to the project site is provided via Tecopa Road located to the east and south of the project site. State Route 160 (SR 160), located approximately 9 miles to the east of the project site in Nevada, is connected to the project site via Tecopa Road. Tecopa Road connects Nevada SR 160 to California State Route 127 (SR 127) located approximately 28 miles to the west of the project site. Regional access to the project area is provided via Interstate 15 (I-15) located approximately 37 miles to the southeast of the project site.

The project site is mostly vacant disturbed private land that has been previously graded for an abandoned residential subdivision. Although the project site does not contain federal land, it is bordered by BLM-managed land to the west, north, and east. The BLM

land is part of the California Desert Conservation Area and the Northern and Eastern Mojave Planning Area.

The topography of the project site slopes gently, with the highest point in the southeastern corner and the lowest point along the northwest boundary. Sandy alluvium extends onto the project site from the northeast and larger ephemeral washes enter the project site from the east near the California-Nevada state line. The climate at the project site is arid with extreme fluctuations in daily and seasonal temperatures. Rainfall mostly occurs from November through March with late summer rainfall (approximately 0.3 inch per month) a regular occurrence.

According to the California Department of Forestry and Fire Protection (CAL FIRE) 2008 Local Responsibility Fire Severity Maps, the project site is within a moderate fire hazard severity zone.

2.2 PROJECT CHARACTERISTICS

The HHSEGS will consist of two solar fields and associated facilities. The northern solar plant is Solar Plant 1 and the southern solar plant is Solar Plant 2. Each solar plant will generate 270 megawatts (MW) gross (250 MW net), for a total net output of 500 MW. Solar Plant 1 will occupy approximately 1,483 acres (or 2.3 square miles). Solar Plant 2 will occupy approximately 1,510 acres (or 2.4 square miles). A 103-acre common area will be provided on the southeastern corner of the site to accommodate an administration, warehouse, and maintenance complex. A temporary construction laydown and parking area occupying 180 acres will be provided on the west side of the site.

The following provides a description of the project elements of the HHSEGS.

2.2.1 Solar Plants

Each solar plant will use heliostats, which are elevated mirrors guided by a tracking system mounted on a pylon, to focus the sun's rays on a solar receiving steam generator (SRSG) on top of a 750-foot tall solar power tower near the center of each solar field. In each plant, one Rankine-cycle steam turbine will receive steam from the SRSG (or solar boiler) to generate electricity. The solar field and power generation equipment will start each morning after sunrise and will shut down when insolation drops below the level required to keep the turbine online.

To save water in the site's desert environment, each solar plant will use a dry-cooling condenser. Cooling will be provided by air-cooled condensers, supplemented by a partial dry-cooling system for auxiliary equipment cooling. Raw water will be drawn daily from onsite wells located in each power block and at the administration building. Groundwater will be treated in an onsite treatment system for use as boiler make-up water and to wash the heliostats. Auxiliary equipment at each plant includes feed water heaters, a deaerator, an emergency diesel generator, and a diesel fire pump.

Each of the power blocks will be connected via underground and overhead generation tie (gen-tie) lines to the switchyard. In addition, each power block will have a gas metering

set. Permanent parking areas will be provided at each power block for operations and maintenance personnel.

2.2.2 Common Area

A 103-acre common area will be established on the southeastern corner of the site to accommodate the following: an administration, warehouse, and maintenance complex; an onsite substation; an asphalt-paved visitor and employee parking area; and landscape areas. The administration complex will occupy approximately 4.8 acres and be served by power from the local 33-kilovolt (kV) distribution system and water from water supply wells located in the common area.

The common area will also be used for temporary construction parking areas, construction trailers, and other construction support facilities. The surface areas within the common area that are used for construction will be stabilized.

2.2.3 Temporary Construction Laydown Area

A 180-acre temporary construction laydown area on the west side of the site will be used for equipment laydown, construction parking, construction trailers, heliostat assembly buildings, and other construction support facilities. The surface areas within the temporary construction area that are used frequently will be stabilized.

2.2.4 Access Roads and Drive Zones

Project access will be from Tecopa Road to the project entrance road on the east side of the project site. Tecopa Road is an existing two-lane paved road. Secondary access will be from Tecopa Road along the west side of the project site and then along a paved road between the two solar plants.

The internal roadway and utility corridors for each heliostat field and its power block will contain a 20-foot-wide paved or hardscape access road from the entrance of the solar plant site to the power block, and then around the power block.

In addition to the paved or hardscaped 20-foot-wide access road to the power block of each solar plant, unpaved roads will radiate out from the power block to provide access through the solar field to the internal perimeter access road. Within the heliostat fields, 20-foot-wide "drive zones" will be located concentrically around the power block to provide access to the heliostat mirrors for maintenance and cleaning. The drive zones will be located approximately 152 feet apart, grubbed to remove vegetation, and smoothed. A 12-foot-wide unpaved path will be constructed on the inside perimeter of the project boundary fence for use by HHSEGS personnel to monitor and maintain perimeter security and the tortoise exclusion fencing. These paths will be grubbed, bladed, and smoothed to facilitate safe use.

2.3 GENERATING FACILITY DESIGN AND OPERATION

This following describes HHSEGS's conceptual design and proposed operation.

2.3.1 Process Description

In each solar project, one Rankine-cycle non-reheat steam turbine receives live steam from the SRSG located in the power block at the top of the solar power tower. The solar field and power generation equipment are started each morning after sunrise and insolation build-up and shut down when insolation drops below the level required to keep the turbine online.

Each solar plant includes one 249 MMBtu/hr natural gas-fired auxiliary boiler that will be used to pre-warm the SRSG and steam turbine generator piping before solar energy is available, minimizing the amount of time required for startup each morning, to assist during shutdown cooling operation, and to augment the solar operation during the evening shoulder period as solar energy diminishes. A small natural gas-fired preservation boiler will be used to maintain system temperatures overnight.

Power Cycle

Solar energy is reflected by the heliostats onto the SRSG where the energy heats water into superheated steam. The steam is the routed via the main steam pipe to the steam turbine generator (STG) where the steam's energy is converted to electrical energy.

The solar plant's power cycle is based on a Rankine-cycle turbine with three pressure stage casings. Primary thermal input is via an SRSG located at the top of the solar power tower. Live superheated steam enters a high pressure (HP) turbine casing at 2,466 pounds per square inch absolute (psia) and 1,085 degrees Fahrenheit (°F) (steam parameters are provided for Normal Continuous Rate).

Following expansion through the HP turbine, the steam is conveyed to the inlet of the intermediate pressure (IP) turbine. Steam enters the IP turbine at 535 psia and 666° F. Upon exiting the IP turbine, the steam travels via the crossover pipe to the inlet of the low pressure (LP) turbine. Steam enters the LP turbine at 78 psia and 310° F and exits at 1.6 psia or 3.25 inches of mercury into the air-cooled condenser.

Condensate is sent from the condenser well through four low-pressure feedwater heaters to the deaerator, which also serves for feedwater reserve storage and is the point of feedwater make-up injection. From the deaerator, high-pressure feedwater pumps send feedwater through three high pressure feedwater heaters and it is returned to the SRSG.

Major Facility Components

Electricity is produced by each solar plant's STG. The following describes the major components of the generating facility.

Solar Field

Each of the heliostat assemblies is composed of two mirrors, each approximately 12 feet high by 8.5 feet wide with a total reflecting surface of 204.7 square feet. Each heliostat assembly is mounted on a single pylon, along with a computer-programmed aiming control system that directs the motion of the heliostat to track the movement of the sun. Communication between the heliostats and the operations center will be done via surface-mounted anchored cable or wireless remote system. The solar field for each solar plant will consist of approximately 85,000 heliostats.

Solar Plants

The following provides further details regarding the two 270-MW solar plants.

- The solar power tower structure height is approximately 590 feet tall.
- The SRSG located at the top of the solar power tower is approximately 160 feet tall, resulting in an overall height of approximately 750 feet.
- No heliostat will be built closer than 394 feet from the solar power tower location.
- For Solar Plant 1, the distance between the solar power tower and the farthest heliostat in the solar field, approximately 7,660 feet, is in the northwest section of the heliostat array. For Solar Plant 2, the longest distance between the solar power tower and the farthest heliostat in the solar field, approximately 6,523 feet, is in the northeast section of the heliostat array. Generally, this is due to the higher efficiency of heliostat in the northern section in the northern hemisphere. With the sun predominantly in the southern sky, the cosine effect of incidence and reflection angles is less in the northern heliostats than in the southern ones. The converse (lower collection efficiency in the southern section) is also true, and, therefore, the maximum southern arc radius is the shortest.
- The eastern sector heliostat energy collection is more valuable than the western sector collection because afternoon energy collection, during on-peak utility hours, is more valuable than morning energy collection during part-peak or off-peak hours.

Steam Turbine Generator

The steam turbine system consists of a condensing STG with gland steam system, lubricating oil system, hydraulic control system, and steam admission/induction valving. HP steam from the SRSG superheater enters the HP steam turbine section through the inlet steam system. The steam expands through multiple stages of the turbine, driving the generator. On exiting the LP turbine, the steam is directed into their air-cooled condenser.

Natural Gas Boilers

Each solar plant will include two types of gas-fired boilers: the auxiliary boiler and the nighttime preservation boiler (described previously). The auxiliary boiler will have a capacity of 350,000 pounds per hour (lb/hr) at 950° F and 1,450 psia. The night preservation boiler will provide superheated steam to the STG and boiler feedwater pump gland systems overnight and during other shutdown periods when steam is not available from the SRSG. The night preservation boiler will produce 8,000 lb/hour at 680° F and 145 psia.

2.3.2 Major Electrical Equipment and Systems

The bulk of the electric power produced by the facility will be transmitted to the grid. A small amount of electric power will be used onsite to power auxiliaries such as pumps and fans, control systems, and general facility loads including lighting, heating, and air conditioning. Some power will also be converted from alternating current (AC) to direct current (DC) and stored in batteries, which will be used as backup power for the plant control systems and essential uses.

2.3.3 Fuel System

Natural gas supply for the HHSEGS will connect to the (Kern River Gas Transmission) KRGT pipeline approximately 35.3 miles southeast of the site. A tap station on the main KRGT transmission pipeline will be installed at this point. The new gas pipeline will proceed approximately 26 miles generally westward from the tap and enter the project site.

From the common area, an underground pipe will be installed along the northeastern border of the Solar Plant 2 solar field. At the road that divides the two solar fields, the pipeline will turn to the southwest and continue to the point where it intersects the road between the two solar plants. At this point, the pipeline will branch with one branch proceeding northwest to Solar Plant 1 and the other southeast to Solar Plant 2. Individual metering sets (including electrical preheaters for the natural gas, pressure-reduction equipment, and filter-separator skids) will be installed at each power block to monitor gas usage.

2.3.4 Water Supply and Use

The following describes the quantity of water required, the sources of the water supply, and water treatment methods.

Six onsite groundwater supply wells will be drilled and developed to provide raw water for the HHSEGS; two new wells per power block (primary and backup) and two wells at the administration complex. The wells will supply both solar plants and will be used for make-up water, mirror wash water, and domestic uses. The entire 500-MW net project will require up to 84.5 gallons per minute (gpm) (average) raw water make-up, with 30 to 50 gpm required by each plant, and 3.5 gpm (average) required for portable water use.

Each solar plant will have a raw water tank with a capacity of 250,000 gallons. A portion of the raw water (100,000 gallons) is for plant use while the majority will be reserved for fire water.

The HHSEGS will generate electricity up to 16 hours a day, with the exception of a scheduled shutdown in late December for maintenance. However, the water treatment plant will operate continuously in order to minimize water treatment system size and capital cost, and to use off-peak energy at night.

The onsite groundwater production wells will supply both solar plants and the administration complex with make-up water, mirror-wash water, and domestic water. Each solar plant will include a water treatment and deionizing facility in the power block area. The combined 500-MW net capacity of the solar plants will require an average of approximately 90 gpm. To provide adequate operating flexibility, 140 acre-feet per year (afy) of water is required for operations and 288 afy will be needed during construction.

2.4.4 Plant Cooling Systems

The cycle heat rejection system will consist of an air-cooled steam condenser system. The heat rejection system will receive exhaust steam from the low-pressure section of the steam turbine and feedwater heaters and condense it back to water for reuse. The condenser will be designed to normally operate at a pressure of about 3.2 inches of mercury absolute (0.11 millibar absolute). The condenser will remove heat from the condensing steam up to a maximum of 1,140 million British thermal units per hour (MMBtu/hr), depending on ambient temperature and plant load.

An auxiliary cooling system will cool the generator, steam turbine generator lubrication oil, boiler feed pump lubricating oil, SRSG circulating water pumps, and other equipment requiring cooling. A maximum of 34 MMBtu/hr will be rejected to the atmosphere via a fin-fan heat exchanger. Above 85° F, the fin-fan heat exchanger will be assisted by a wet surface air cooler using intermediate quality deionized water.

2.4.5 Waste Management

Waste Water Collection, Treatment, and Disposal

The primary wastewater collection system will collect and process wastewater from all of the solar plant equipment, including the boilers and water treatment equipment. To the extent practical, process wastewater will be recycled and reused. Each solar plant and the administration complex will include a septic tank and leach field system for sanitary water streams, including showers and toilet. When needed, septic tank contents will be removed from site by a sanitary service.

The following describes the wastewater collection, treatment, and disposal for the HHSEGS.

Plant Drains and Oil/Water Separator

General plant drains will collect containment area washdown, sample drains, and drainage from facility equipment drains. Water from these areas will be collected in a system of floor drains, hub drains, sumps, and piping and routed to the wastewater collection system. Drains that potentially could contain oil or grease will first be routed through an oil/water separator. Water from the process wastewater collection system will be returned back into the raw water storage tank. Water passing through the oil/water separator will be reduced in volume by the thermal evaporator, the reject from which will be trucked offsite for disposal.

Power Cycle Makeup Water Treatment Wastes

High quality deionized water from the high quality deionized water tank will be used as the feed water from the power-cycle makeup treatment system.

SRSG and Boiler Blowdown

SRSG and natural-gas-fired boiler blowdown will consist of boiler water discharged from the SRSG and five boilers to control the concentration of dissolved solids and silica within acceptable ranges. The blowdown will be discharged to flash tanks.

Steam from the flash tanks will be recovered back into the steam cycle via the deaerator. Condensate from the flash tanks will be further flashed to atmosphere then cooled and recycled to the raw water storage tank. As an alternative, blowdown may be discharged to the wastewater collection tank for treatment.

Solid Wastes

The HHSEGS will produce maintenance and plant wastes typical of power generation operations. Generation plant wastes may include oily rags, broken and rusted metal and machine parts, defective or broken electrical materials, empty containers, and other solid wastes, including the typical refuse generated by workers. Solid wastes will be trucked offsite for recycling or disposal.

Liquid Wastes

Waste lubrication oil will be recovered and recycled by a waste oil recycling contractor. Spent lubrication oil filters will be disposed of at an appropriate disposal facility. Workers will be trained to handle hazardous wastes generated at the project site.

Hazardous Wastes

Several methods will be used to properly manage and dispose of hazardous wastes generated by the HHSEGS. Chemical cleaning wastes will consist of alkaline and acid cleaning solutions used during pre-operational chemical cleaning of the boilers and acid cleaning solutions used for chemical cleaning of the boilers after the units are put into service. These wastes, which are subject to high metal concentrations, will be

temporarily stored onsite in portable tanks or sumps and disposed offsite by the chemical cleaning contractor in accordance with applicable regulatory requirements.

2.4.6 Management of Hazardous Materials

A variety of chemicals will be stored and used onsite during construction and operation. The storage, handling, and use of all chemicals will be conducted in accordance with applicable laws, ordinances, regulations, and standards (LORS) as defined in Section 3.0. Section 6.0 provides a description of the types, locations and quantities of hazardous material storage onsite. Chemicals will be stored in appropriate chemical storage facilities. Bulk chemicals will be stored in tanks and most other chemicals will be stored in returnable delivery containers. Chemical storage and chemical feed areas will be designed to contain leaks, spills, and stormwater. Concrete containment pits and drain piping design will allow a full-tank capacity spill without overflowing the containment. For multiple tanks located within the same containment area, the capacity of the largest single tank will determine the volume of the containment area and drain piping. Drain piping for reactive chemicals will be trapped and isolated from other drains to eliminate noxious or toxic vapors.

Safety showers and eyewashes will be provided adjacent to, or in the vicinity of, chemical storage and use areas. Plant personnel will use approved personal protective equipment during chemical spill containment and cleanup activities. Personnel will be properly trained in the handling of these chemicals and instructed in the procedures to follow in case of a chemical spill or accidental release. Adequate supplies of absorbant material will be stored onsite for spill cleanup.

2.4.7 Emission Control and Monitoring

Air emissions from the combustion of natural gas in the auxiliary-boilers at each plant will be controlled using appropriate air emission control devices. The boilers will be provided with ultra-low NO_x burners and flue gas recirculation to minimize NO_x emissions. Particulate emissions will be controlled by the use of best combustion practices, the use of natural gas, which is low in sulfur, as the sole fuel for the boilers, and high-efficiency air inlet filtration.

The auxiliary boilers and night preservation boiler will use predictive emissions monitoring in lieu of continuous monitoring of NO_x (40 CFR 48b(g)(2)), and will use the low mass emissions (LME) alternative to acid rain continuous emission monitoring system (CEMS) to comply with the monitoring requirements of Part 75.

2.5 SCHEDULE

2.5.1 Construction Schedule

The construction of the HHSEGS, from perimeter fencing to site preparation and grading to commercial operation, is expected to last approximately 29 months. Construction of Solar Plant 1 would begin first. However, construction of the common area facilities would occur concurrently with the construction of Solar Plant 1.

Onsite there will be an average and peak workforce of approximately 634 and 1,033, respectively, of construction craft people, supervisory, support, and construction management personnel during construction. The peak construction site workforce level is expected to occur in month 14.

Generally, construction activities will occur from 5:00 a.m. to 3:30 p.m. with a swing shift during heliostat assembly from 6:00 p.m. to 4:00 a.m. Additional hours may be necessary to make up schedule deficiencies, or to complete critical construction activities (e.g., tower construction, foundation pouring, or working around time-critical shutdowns and constraints). During some construction periods and during the startup phase of the project, some activities will continue 24 hours per day, 7 days per week.

2.5.2 Generating Facility Operation

Management, engineering, administration staff, skilled workers, and operators will serve both plans. The HHSEGS is expected to employ up to 120 full-time employees: 36 at Solar Plant 1 (including mirror washing machine operators); 36 at Solar Plant 2 (including mirror washing machine operators); and 48 at the administration complex. The facility will operate 7 days a week.

Detailed long-term maintenance schedules are currently unavailable, but will include periodic maintenance and overhauls in accordance with manufacturer recommendations. To maintain heliostat performance, nighttime labor demand includes an average 10 hours of mirror washing per day, covering the entire solar field every 2 weeks.

The HHSEGS is expected to have an annual plant availability of 92 to 98 percent. It will be possible for plant availability to exceed 98 percent for a given 12-month period.

The facility may be operated in one of the following modes:

- The facility would be operated at its maximum continuous output for as many hours per year as solar input allows; or
- A full shutdown will occur if forced by equipment malfunction, transmission or gas line disconnect, or scheduled maintenance.

3.0 APPLICABLE STANDARDS

The following provides a discussion of the laws, ordinances, regulations, and standards related to worker safety and health, fire protection, and emergency medical services that are applicable to the HHSEGS.

3.1 FEDERAL AND STATE LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following federal and state laws, ordinances, regulations, and standards (LORS) related to worker health and safety, fire protection services, and emergency medical services are applicable to the construction and ongoing operation of the HHSEGS:

Laws, Ordinances, Regulations, and Standards Applicable for Worker Safety and Health

LORS	Applicability
Federal	
Title 29 Code of Federal Regulations (CFR) Part 1910	Contains the minimum occupational safety and health standards for general industry in the United States
Title 29 CFR Part 1926	Contains the minimum occupational safety and health standards for the construction industry in the United States
State	
California Occupational Safety and Health Act, 1970	Establishes minimum safety and health standards for construction and general industry operations in California
8 California Code of Regulations (CCR) 339	Requires list of hazardous chemicals relating to the Hazardous Substance Information and Training Act
8 CCR 450	Addresses hazards associated with pressurized vessels
8 CCR 750	Addresses hazards associated with high-pressure steam
8 CCR 1509	Addresses requirements for construction, accident, and prevention plans
8 CCR 1509, et seq., and 1684, et seq.	Addresses construction hazards, including head, hand, and foot injuries and noise and electrical shock
8 CCR 1528, et seq., and 3380, et seq.	Requirements for personal protective equipment (PPE)
8 CCR 1597, et seq., and 1590, et seq.	Requirements for addressing the hazards associated with traffic accidents and earth-moving
8 CCR 1604, et seq.	Requirements for construction hoist equipment
8 CCR 1620, et seq., and 1723, et seq.	Addresses miscellaneous hazards

LORS	Applicability
8 CCR 1709, et seq.	Requirements for steel reinforcing, concrete pouring and structural steel erection operations
8 CCR 1920, et seq.	Requirements for fire protection systems
8 CCR 2300, et seq., and 2320, et seq.	Requirements for addressing low-voltage electrical hazards
8 CCR 2395, et seq.	Addresses electrical installation requirements
8 CCR 2700, et seq.	Addresses high-voltage electrical hazards
8 CCR 3200, et seq. and 5139, et seq.	Requirements for control of hazardous substances
8 CCR 3203, et seq.	Requirements for operational accident prevention programs
8 CCR 3270, et seq., and 3209, et seq.	Requirements for evacuation plans and procedures
8 CCR 3301, et seq.	Requirements for addressing miscellaneous hazards, including hot pipes, hot surfaces, compressed air systems, relief valves, enclosed areas containing flammable or hazardous materials, rotation equipment, pipelines and vehicle-loading dock operations
8 CCR 3360, et seq.	Addresses requirements for sanitary conditions
8 CCR 3511, et seq., and 3555, et seq.	Requirements for addressing hazards associated with stationary engines, compressors, and portable, pneumatic, and electrically powered tools
8 CCR 3649, et seq., and 3700, et seq.	Requirements for addressing hazards associated with field vehicles
8 CCR 3940, et seq.	Requirements for addressing hazards associated with power transmission, compressed air, and gas equipment
8 CCR 5109, et seq.	Requirements for addressing construction accident and prevention programs
8 CCR 5110, et seq.	Requirements for the implementation of an ergonomics program
8 CCR 5139, et seq.	Requirements for addressing hazards associated with welding, sandblasting, grinding, and spray-coating
8 CCR 5150, et seq.	Requirements for confined space entry
8 CCR 5160, et seq.	Requirements for addressing hot, flammable, poisonous, corrosive, and irritant substances
8 CCR 5192, et seq.	Requirements for conduction emergency response operations
8 CCR 5194, et seq.	Requirements for employee exposure to dusts, fumes, mists, vapors, and gases

LORS	Applicability
8 CCR 5405, et seq.; 5426, et seq.; 5465, et seq.; 5500, et seq.; 5521, et seq.; 5545, et seq.; 5554, et seq.; 5565, et seq.; 5583, et seq.; and 5606, et seq.	Requirements for flammable liquids, gases, and vapors
8 CCR 5583, et seq.	Requirements for design, construction, and installation of venting, diking, valving, and supports
8 CCR 6150, et seq.; 6151, et seq.; 6165, et seq.; 6170, et seq.; and 6175, et seq.	Provides fire protection requirements
24 CCR 3, et seq.	Incorporates current edition of Uniform Building Code
8 CCR, Part 6	Provides health and safety requirements for working with tanks and boilers
California Health and Safety Code Section 25500, et seq.	Requires that every new or modified facility that handles, treats, stores or disposes of more than the threshold quantity of any of the listed acutely hazardous materials prepare and maintain a Risk Management Plan (RMP)
California Health and Safety Code Section 25500 through 25541	Requires the preparation of a Hazardous Material Business Plan (HMBP) that details emergency response plans for a hazardous materials emergency at the facility

Laws, Ordinances, Regulations, and Standards Applicable to Hazardous Materials Handling

LORS	Applicability
Federal	
Title 29 Code of Federal Regulations (CFR) Part 1910, et seq. and Part 1926, et seq.	Requirements for equipment used to store and handle hazardous materials
Risk Management Plan (Title 40 CFR 68)	Requires facilities storing or handling significant amounts of acutely hazardous materials to prepare and submit Risk Management Plans
Title 49 CFR Parts 172, 173, and 179	Provides standards for labeling and packaging of hazardous materials during transportation
Section 302, EPCRA (Pub. L. 99-499, 42 USC 11022) Hazardous Chemical Reporting: Community Right-To-Know (40 CFR 370)	Requires one time notification if extremely hazardous substances are stored in excess of Threshold Planning Quantities (TPQs)
Section 304, EPCRA (Pub. L. 99-499, 42 USC 11002) Emergency Planning and Notification (40 CFR 355)	Requires notification when there is a release of hazardous material in excess of its Reportable Quantity (RQ)
Section 311, EPCRA (Pub. L. 99-499, 42 USC 11021) Hazardous Chemical Reporting: Community Right-To-Know (40 CFR 370)	Requires that either Material Safety Data Sheets (MSDSs) for all hazardous materials or a list of all hazardous materials be submitted to the State Emergency Response Commission (SERC), Local

LORS	Applicability
	Emergency Planning Committee (LEPC), and Inyo County Department of Environmental Services
Section 313, EPCRA (Pub. L. 99-499, 42 USC 11023) Toxic Chemical Release Reporting: Community Right-To-Know (40 CFR 372)	Requires annual reporting of releases of hazardous materials
Section 311, Clean Water Act (Pub. L. 92-500, 33 USC 1251, et seq.) Oil Pollution Prevention (40 CFR 112)	Requires preparation of a Spill Prevention Control and Countermeasure (SPCC) plan if oil is stored in a single aboveground storage tank with a capacity greater than 660 gallons or if the total petroleum storage (including ASTs, oil-filled equipment, and drums) is greater than 1,320 gallons The facility will have petroleum in excess of the aggregate volume of 1,320 gallons
Pipeline Safety Laws (49 USC 60101, et seq.) Hazardous Materials Transportation Laws (49 USC 5101, et seq.) Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards (49 CFR 192)	Specifies natural gas pipeline construction, safety, and transportation requirements
State	
Health and Safety Code, Section 25500, et seq. (HMBP)	Requires preparation of an Hazardous Material Business Plan (HMBP) if hazardous materials are handled or stored in excess of threshold quantities
Health and Safety Code, Section 25270 through 25270.13 (Aboveground Petroleum Storage Act)	Requires preparation of an SPCC plan if oil is stored in a single aboveground storage tank with a capacity greater than 660 gallons or if the total petroleum storage (including ASTs, oil-filled equipment, and drums) is greater than 1,320 gallons The facility will have petroleum in excess of the aggregate volume of 1,320 gallons
Health and Safety Code, Section 25249.5 through 25249.13 (Safe Drinking Water and Toxics Enforcement Act) (Proposition 65)	Requires warning to persons exposed to a list of carcinogenic and reproductive toxins and protection of drinking water from the same toxins
Health and Safety Code, Article 2, Chapter 6.95, Sections 25531 to 25541; California Code of Regulations (CCR) Title 19 (Public Safety), Division 2 (Office of Emergency Services), Chapter 4.5 (California Accidental Release Prevention Program)	Requires facilities storing or handling significant amounts of acutely hazardous materials to prepare and submit Risk Management Plans
California Public Utilities Commission (CPUC) General Oder Nos. 112-E and 58-A	Specify standards for gas service and construction of gas gathering, transmission, and distribution piping systems

3.2 NATIONAL CONSENSUS STANDARDS

The following national consensus standards related to worker health and safety, fire protection services, and emergency medical services are applicable to the construction and ongoing operation of the HHSEGS:

Applicable National Consensus Standards

LORS	Applicability
Uniform Fire Code, Article 80	Addresses the prevention, control, and mitigation of dangerous conditions related to storage, dispensing, use and handling of hazardous materials and information need by emergency response personnel
National Fire Protection Association (NFPA) 10, Standard for Portable Fire Extinguishers	Requirements for selection, placement, inspection, maintenance, and employee training for portable fire extinguishers
NFPA 11, Standard for Low-Expansion Foam and Combined Agent Systems	Requirements for installation, and use of low-expansion foam and combined –agent systems
NFPA 11A, Standard for Medium- and High-Expansion Foam Systems	Requirements for installation and use of medium- and high-expansion foam systems
NFPA 12, Standard on Carbon Dioxide Extinguishing Systems	Requirements for installation and use of carbon dioxide extinguishing systems
NFPA 13, Standard for Installation of Sprinkler Systems	Guidelines for selection and installation of fire sprinkler systems
NFPA 14, Standard for the Installation of Standpipe and Hose Systems	Guidelines for selection and installation of standpipe and hose systems
NFPA 15, Standard for Water Spray Fixed Systems	Guidelines for selection and installation of water fixed spray systems
NFPA 17, Standard for Dry Chemical Extinguishing Systems	Guidance for selection and use of dry chemical extinguishing systems
NFPA 20, Standard for the Installation of Centrifugal Fire Protection	Guidance for selection and installation of centrifugal fire pumps
NFPA 22, Standard for Water Tanks for Private Fire Protection	Requirements for water tanks for private fire prevention
NFPA 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances	Requirements for private fire services mains and their appurtenances
NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems	Requirements for the periodic inspection, testing, and maintenance of water-based fire protection systems, including land-based and marine applications
NFPA 30, Flammable and Combustible Liquid Code	Requirements for storage and use of flammable and combustible liquids
NFPA 37, Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines	Fire protection requirements for installation and use of combustion engines and gas turbines

LORS	Applicability
NFPA 50A, Standard for Gaseous Hydrogen Systems at Consumer Sites	Fire protection requirements for hydrogen systems
NFPA 54, National Fuel Gas Code	Fire protection requirements for use of fuel gases
NFPA 59A, Standard for the Storage and Handling of Liquefied Petroleum Gases	Requirements for storage and handling of liquefied petroleum gases
NFPA 68, Guide for Explosion Venting	Guidance in design of facilities for explosion venting
NFPA 70, National Electric Code	Guidance on safe selection and design, installation, maintenance, and construction of electrical systems
NFPA 70B, Recommended Practice for Electrical Equipment Maintenance	Guidance on electrical equipment maintenance
NFPA 70E, Standard for Electrical Safety Requirements for Employee Workplaces	Employee safety requirements for working with electrical equipment
NFPA 72, Standard for the Installation, Maintenance and Use of Local Protective Signaling Systems for Guard's Tour, Fire Alarm and Supervisory Service	Requirements for installation, maintenance, and use of local protective signaling systems
NFPA 75, Standard for the Protection of Electronic Computer/Data Processing Equipment	Requirements for fire protection systems used to protect computer systems
NFPA 80, Standard for Fire Doors and Windows	Requirements for fire doors and windows
NFPA 85, Boiler and Combustion Systems and Hazard Code	Requirements for boiler design, installation, operation, maintenance, and training
NFPA 90A, Standard for the Installation of Air Conditioning and Ventilation Systems	Requirements for installation of air conditioning and ventilating systems
NFPA 101, Code for Safety to Life from Fire in Buildings and Structures	Requirements for design of means of exiting the facility
NFPA 291, Recommended Practice for Fire Flow Testing and Marking of Hydrants	Guidelines for testing and marking of fire hydrants
NFPA 850, Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations	Requirements for fire protection in electric generating plants and alternative fuel electric generating plants
NFPA 1961, Standard for Fire Hose	Specifications for fire hose
NFPA 1962, Standard for the Care, Maintenance, and Use of Fire Hose Including Connections and Nozzles	Requirements for care, maintenance, and use of fire hose
NFPA 1963, Standard for Screw Threads and Gaskets for Fire Hose Connections	Specifications for fire hose connections
American National Standards Institute/American Society for Mechanical Engineers (ANSI/ASME), Boiler and Pressure Vessel Code	Specifications and requirements for pressure vessels
ANSI, B31.2, Fuel Gas Piping	Specifications and requirements for fuel gas piping

3.3 LOCAL STANDARDS

The Southern Inyo Fire Protection District (SIFPD) does not have a fire department master plan or response standards. In addition, the SIFPD does not reference the NFPA 1720 as their response standard.

4.0 FIRE PROTECTION SYSTEM

The fire protection system will be designed to protect personnel and limit property loss and plant downtime in the event of a fire. The system will be designed to limit the spread of any fire generated at the plant site to adjacent land to avoid igniting a wildland fire. The primary source of fire protection water will be the raw water storage tank.

An electric jockey pump and electric-motor-driven main fire pump will be provided to increase the water pressure in the plant fire main to a level required to serve all fire fighting systems. In addition, a back-up, diesel-engine-driven fire pump will be provided to pressurize the fire loop if the power supply to the electric-motor-driven main fire pump fails. A fire pump controller will be provided for each fire pump.

The fire pump will discharge to a dedicated underground firewater loop piping system. Normally, the jockey pump will maintain pressure in the firewater loop. Both the fire hydrants and the fixed suppression systems will be supplied from the firewater loop. Fixed fire suppression systems will be installed at determined fire risk areas such as the transformers and turbine lube oil equipment. Sprinkler systems will also be installed in the administration complex buildings and fire pump enclosure as required by National Fire Protection Association (NFPA) and local code requirements. Handheld fire extinguishers of the appropriate size and rating will be located in accordance with NFPA 10 throughout the facility. Onsite personnel will be trained in the use of fire protection equipment and will be the first responders to a fire and/or a medical emergency incident. Generator step-up transformers and other oil-filled transformers will be contained and provided with a fire protection system per NFPA 850.

Refer to Appendix B for the *HHSEGS Fire Protection Design Basis*.

5.0 SAFETY AND HEALTH PROGRAMS

5.1 CONSTRUCTION SAFETY AND HEALTH PROGRAMS

During the construction phase, the HHSEGS will include the implementation of the Safety and Health Programs listed below. Prior to the start of construction, detailed programs and plans will be provided to the CEC, the SIFPD, and other agencies as a Condition of Certification. They are as follows:

- Injury and Illness Prevention Program
  - Philosophy and safety commitment
  - Safety leadership and responsibilities
  - Accountability
  - Specific core safety processes (see Construction Safety Programs below)
  - Employee communication
  - Planning "job hazard analysis and pre-task"
  - Compliance with work rules and safe work practices
  - Measurement of compliance and effectiveness of prevention methods
  - Communication of performance and implementation of necessary improvements
  - Training and other communication requirements

- Fire Protection and Prevention Program
  - General requirements
  - Housekeeping and proper material storage
  - Employee alarm/communication system
  - Portable fire extinguishers
  - Fixed firefighting equipment
  - Fire control and containment
  - Flammable and combustible liquid storage
  - Use of flammable and combustible liquids
  - Dispensing and disposal of flammable liquids
  - Service and refueling areas
  - Training

- Personal Protective Equipment Program
  - Personal protective devices
  - Head protection
  - Eye/face protection
  - Body protection
  - Hand protection
  - Foot protection
  - Skin protection
  - Fall protection
  - High-voltage protection

Respiratory protection
Hearing protection
Hazard analysis
Training

- Emergency Action Program/Plan
  Emergency procedures for the protection of personnel, equipment, the environment, and materials:
  Fire and emergency reporting procedures
  Response actions for accidents involving personnel and or property
  Bomb threats
  Site assembly and emergency evacuation route procedures
  Natural disasters response

  Reporting and notification procedures for emergencies and contacts including offsite and local authorities:
  Alarm and communication services
  Spill response, prevention, and control action plan
  Emergency response equipment
  Emergency personnel (response team) responsibilities and notification roster
  Training requirements

- Construction Safety Programs
  - Motor Vehicle and Heavy Equipment Safety Program
    Operation and maintenance of vehicles
    Inspection
    Personal protective equipment
    Training
  - Forklift Operation Program
    Trained and certified operators
    Fueling operations
    Safe operating parameters
    Training
  - Excavation/Trenching Program
    Shoring, sloping, and benching requirements
    California Occupational Safety and Health Administration (CAL/OSHA) permit requirements
    Inspection
    Air monitoring
    Access and egress
  - Fall Protection Program
    Evaluation of fall hazards
    Protection devices
    Training
  - Scaffolding/Ladder Safety Program

  - Construction and inspection of equipment
  - Proper use
  - Training
- Articulating Boom Platforms Program
  - Inspection of equipment
  - Load ratings
  - Safe operating parameters
  - Training
- Crane and Material Handling Program
  - Certified and licensed operators
  - Inspection of equipment
  - Load ratings
  - Safe operating parameters
  - Training
- Hazardous Waste Program
  - Evaluation of hazard
  - Training
  - Air monitoring
  - Medical surveillance
  - Health and Safety Plan (HSP) preparation
- Hot Work Safety Program
  - Welding and cutting procedures
  - Fire watch
  - Hot work permit
  - PPE
  - Training
- Employee Exposure Monitoring Program
  - Exposure evaluation
  - Monitoring requirements
  - Reporting of results
  - Medical surveillance
  - Training
- Electrical Safety Program
  - Grounding procedure
  - Lock-out/tag-out (LO/TO) procedures
  - Overhead and underground utilities
  - Utility clearance
  - Training
- Permit-Required Confined-space Entry Program
  - Air monitoring and ventilation requirements
  - Rescue procedures
  - LO/TO and blocking, binding, and blanking requirements

Permit completion
Training

- Hand and Portable Power Tool Safety Program
  Guarding and proper operation
  Training
- Housekeeping and Material Handling and Storage Program
  Storage requirements
  Walkways and work surfaces
  Equipment handling requirements
  Training
- Hearing Conservation Program
  Identifying high-noise environments
  Exposure monitoring
  Medical surveillance requirements
  Hearing-protective devices
  Training
- Back Injury Prevention Program
  Proper lifting and material handling procedures
  Training
- Hazard Communication Program
  Labeling requirements
  Storage and handling
  Material Safety Data Sheets (MSDS)
  Chemical inventory
  Training
- Respiratory Protection Program
  Selection and use
  Storage
  Fit testing
  Medical requirements
  Inspection and repair
  Training
- Heat and Cold Stress Monitoring and Control Program
  Monitoring requirements
  Prevention and control
- Pressure Vessel and Pipeline Safety Program
  Line-breaking program
  Equipment inspection and maintenance
  Blocking, bleeding, and blanking
  Training

5.2 OPERATIONS SAFETY AND HEALTH PROGRAMS

After the completion of the construction phase and the commencement of the operation of the HHSEGS, the construction Safety and Health Programs will transition into an operation-oriented program reflecting the hazards and controls necessary. Detailed programs and plans will be submitted to the CEC, the SIFPD, and other agencies as a Condition of Certification. They are as follows:

- Injury and Illness Prevention Program
  - Personnel with the responsibility and authority for implementing the plan
  - Safety and health policy
  - Work rules and safe work practices
  - System for ensuring that employees comply with safe work practices
  - Employee communications
  - Identification and evaluation of workplace hazards

- Fire Protection and Prevention Program
  - General requirements
  - Fire hazard inventory, including ignition sources and mitigation
  - Housekeeping and proper materials storage
  - Employee alarm/communication system
  - Portable fire extinguishers
  - Fixed firefighting equipment
  - Fire control
  - Flammable and combustible liquid storage
  - Use of flammable and combustible liquid
  - Dispensing and disposal of liquids
  - Training
  - Personnel to contact for information on plan contents

- Emergency Action Program/Plan (Part of Risk Management Plan)
  - Emergency escape procedures and emergency escape route assignments
  - Procedures to be followed by employees who remain to operate critical plant operations before they evacuate
  - Procedures to account for all employees after emergency evacuation has been completed
  - Rescue and medical duties for those employees performing rescue and medical duties
  - Fire and emergency reporting procedures
  - Alarm and communication system
  - Personnel to contact for information on plan contents
  - Training requirements

- Personal Protective Equipment Program
  - Hazard analysis and prescription of Personal Protective Equipment
  - Personal protective devices

Head protection
Eye and face protection
Body protection
Hand protection
Foot protection
Skin protection
Sanitation
Safety belts and life lines for fall protection
Protection for electric shock
Medical services and first aid/blood borne pathogens
Respiratory protective equipment
Hearing protection
Training

- Plant Operation Safety Program
  - Motor Vehicle and Heavy Equipment Safety Program
    Operation and maintenance of vehicles
    Inspection
    Personal protective equipment
    Training
  - Forklift Operation Program
    Trained and certified operators
    Fueling operations
    Safe operating parameters
    Training
  - Excavation/Trenching Program
    Shoring, sloping, and benching requirements
    Cal-OSHA permit requirements
    Inspection
    Air monitoring
    Access and egress
  - Fall Protection Program
    Evaluation of fall hazards
    Protection devices
    Training
  - Scaffolding/Ladder Safety Program
    Construction and inspection of equipment
    Proper use
    Training
  - Articulating Boom Platforms Program
    Inspection of equipment
    Load ratings
    Safe operating parameters
    Operator training

- Crane and Material Handling Program
  - Certified and licensed operators
  - Inspection of equipment
  - Load ratings
  - Safe operating parameters
  - Training
- Hot Work Safety Program
  - Welding and cutting procedures
  - Fire watch
  - Hot work permit
  - Personal protective equipment
  - Training
- Workplace Ergonomics Program
  - Identification of personnel at risk
  - Evaluation of personnel
  - Workplace and job activity modifications
  - Training
- Employee Exposure Monitoring Program
  - Exposure evaluation
  - Monitoring requirements
  - Reporting of results
  - Medical surveillance
  - Training
- Electrical Safety Program
  - Grounding procedure
  - LO/TO procedures
  - Overhead and underground utilities
  - Utility clearance
  - Training
- Permit-Required Confined Space Entry Program
  - Air monitoring and ventilation requirements
  - Rescue procedures
  - LO/TO and blocking, blinding, and blanking requirements
  - Permit completion
  - Training
- Hand and Portable Power Tool Safety Program
  - Guarding and proper operation
  - Training
- Housekeeping and Material Handling and Storage Program
  - Storage requirements
  - Walkways and work surfaces
  - Equipment handling requirements
  - Training

- Hearing Conservation Program
  - Identifying high-noise environments
  - Exposure monitoring
  - Medical surveillance requirements
  - Hearing protective devices
  - Training
- Back Injury Prevention Program
  - Proper lifting and material handling procedures
  - Training
- Hazard Communication Program
  - Labeling requirements
  - Storage and handling
  - MSDS
  - Chemical inventory
  - Training
- Respiratory Protection Program
  - Selection and use
  - Storage
  - Fit testing
  - Medical requirements
  - Inspection and repair
  - Training
- Heat and Cold Stress Monitoring and Control Program
  - Monitoring requirements
  - Prevention and control
- Pressure Vessel and Pipeline Safety Program
  - Line-breaking policy
  - Equipment inspection and maintenance
  - Blocking, bleeding, and blanking
  - Communication
  - Training
- Safe Driving Program
  - Inspection and maintenance
  - Training

5.3 TRAINING PROGRAMS

5.3.1 Construction Training Program

The following summarizes the construction training program that will be implemented to ensure that employees recognize and understand how to protect themselves from potential hazards. The training will be delivered to the employees in various ways depending on the requirements of the California Occupational Safety and Health Administration (Cal-OSHA) standards, the complexity of the topic addressed, the characteristics of the workforce, and the degree of risk associated with each of the potential hazards.

Construction Training Program

Training Course	Target Employees
Injury and Illness Prevention Training	All employees
Emergency Action Program/Plan	All employees
Personal Protective Equipment Training	All employees
Motor Vehicle and Heavy Equipment Safety Training	Employees working on, near, or with heavy equipment or vehicles
Forklift Operation Training	Employees operating forklifts
Excavation/Trenching Safety Training	Employees involved with trenching or excavation
Fall Protection Training	Employees working at heights greater than 6 feet or required to use fall protection
Scaffolding/Ladder Safety Training	Employees required to erect or use scaffolding
Crane Safety Training	Employees supervising or performing crane operations
Fire Protection and Prevention Training	Employees responsible for the handling and storage of flammable or combustible liquids or gases
Hazard Communication Training	Employees handling or working with hazardous materials
Hazardous Waste	Employees handing or excavating hazardous waste
Hot Work Safety Training	Employees performing hot work
Fire Prevention and Protection Training	Employees performing hot work
Electrical Safety Training	Employees performing LO/TO or working on systems that require LO/TO activities
Electrical Safety Training	Employees required to work on electrical systems and equipment, or use electrical equipment and cords
Permit-Required Confined-Space Entry Training	Employees required to supervise or perform confined-space entry activities

Training Course	Target Employees
Hand and Portable Power Tool Safety Training	Employees that will be operating hand and portable power tools
Heat Stress and Cold Stress Safety Training	Employees that are exposed to temperature extremes
Hearing Conservation Training	All employees
Back Injury Prevention Training	All employees
Safe Driving Training	Employees supervising or diving motor vehicles
Pressure Vessel and Pipline Safety Training	Employees supervising or working on pressurized systems or equipment
Respiratory Protection Training	All employees required to wear respiratory protection
Fire Protection and Prevention Training	All employees

5.3.2 Operations Training Program

The following summarizes the operations training program that will be implemented to ensure that employees recognize and understand how to protect themselves from potential hazards. The training will be delivered to the employees in various ways depending on the requirements of the Cal-OSHA standards, the complexity of the topic addressed, the characteristics of the workforce, and the degree of risk associated with each of the potential hazards.

Operations Training Program

Training Course	Target Employees
Injury and Illness Prevention Training	All employees
Emergency Action Plan	All employees
Personal Protective Equipment Training	All employees
Excavation/Trenching Safety Training	Employees involved with trenching or excavating
Scaffolding/Ladder Safety Training	Employees required to erect or use scaffolding
Fall Protection Training	Employees required to use fall protection
Forklift Operator Training	Employees operating forklifts
Crane Safety Training	Employees supervising or performing crane operations
Workplace Ergonomics	Employees performing repetitive activities
Fire Protection and Prevention Training	Employees responsible for the handling and storage of flammable or combustible liquids or gasses
Hot Work Safety Training	Employees performing hot work

Training Course	Target Employees
Electrical Safety Training	Employees performing LO/TO
Electrical Safety	Employees required to work on electrical systems and equipment
Permit-Required Confined-space Entry	Employees required to supervise or perform confined-space entry
Hand and Portable Power Tool Safety Training	Employees that will be operating hand and portable power tools
Heat Stress and Cold Stress Safety Training	Employees exposed to temperature extremes
Hearing Conservation Training	All employees
Back Injury Prevention Training	All employees
Safe Driving Training	Employees supervising or driving motor vehicles
Hazard Communication Training	Employees handing or working around hazardous materials
Pressure Vessel and Pipeline Safety Training	Employees supervising or working on pressurized systems or equipment
Fire Protection and Prevention Training	All employees

6.0 SUMMARY OF THE RISKS OF THE PROJECT

Based on the potential hazards identified in the HHSEGS Fire and Emergency Services Risk Assessment (including compliance with the applicable standards, and the implementation of the fire protection systems and safety and health programs), the potential risks as a result of the construction activities and operation of the HHSEGS that would require fire protection and emergency medical services have been summarized below. Refer to the HHSEGS Fire and Emergency Services Risk Assessment for a discussion of the analysis.

Hazard	Level of Risk
Use and storage of hazardous materials during construction	Extremely low
Use and storage of hazardous materials during operation and maintenance	Extremely low
Accidental release of hazardous materials	Extremely low
Fire or explosion from hazardous materials	Extremely low
Fire from use of natural gas	Extremely low
Worker safety related to height of tower during construction, operation, and maintenance	Extremely low
Worker safety related to work in confined spaces during construction, operation, and maintenance	Extremely low
Worker safety related to height of tower during construction, operation and maintenance	Extremely low
Offsite vehicle accidents	Extremely low

Source: Pacific Development Solutions Group, March 28, 2012

The potential levels of risk are: high, moderate, low, extremely low, remote, and extremely remote.

7.0 EXISTING RESOURCES

7.1 FIRE RESOURCES

The Southern Inyo Fire Protection District (SIFPD), as the Authority Having Jurisdiction (AHJ), provides fire protection and emergency medical services (basic life support only) to the project site. The SIFPD has an office and station located at 410 Tecopa Hot Springs Road, Tecopa, California. They serve an area of 1,250 square miles with approximately 300 residents and are dispatched by the Inyo County Sheriff's Office.

The current staffing level for the SIFPD consists of: Fire Chief, an Administrative Officer, two Emergency Medical Technicians-Basic Life Support, one Fire Fighter II, and four entry-level Fire Fighter/First responder. With the exception of the Fire Chief and the Administrative Officer, which are paid, the SIFPD personnel are volunteers that respond on a 24-hour 7-day per week basis. The SFPD equipment consists of two Light Rescue Units, two Type 2 Engines, one Basic Life Support Ambulance, and one Ambulance (not staffed).

Table 7-1 provides the fire stations that are closest to the HHSEGS project site and their respective distances and response times to the project site. The SIFPD station, which is the first responder, is located approximately 22 miles from the HHSEGS project site. The SIFPD estimates that the current response time to the project site is 30-40 minutes.

The SIFPD is in the process of finalizing a mutual aid agreement with Pahrump Valley Fire-Rescue Services (PVFRS) located in Pahrump, Nevada, approximately 12 miles to the northeast. The PVFRS serves an area of 400 square miles (with an additional 200 square miles under automatic mutual aid in Clark County) with approximately 40,000 permanent residents and 5,000 seasonal residents. Fire protection and emergency medical services are provided from four stations, two (Stations Nos. 3 and 5) of which are manned by full-time career personnel, one (Station No. 1) that has both full-time career personnel and volunteers, and one (Station No. 2) that has all volunteers. The PVFRS equipment consists of: four Class "A" (Type 1) engines, one Reserve Class "A" (Type 1) engine, one ARFF Engine, one 75-foot Tower Ladder, one Heavy Rescue, two Type III Brush Trucks, two Type VI Brush Quick Attacks, three Water Tenders (3,500 gallons each), five Advanced Life Support Ambulances, two Advanced Life Support Squads (4-wheel drive SUVs), one Command Vehicle, one HAZ Mat Response Trailer, two General Utility Trucks, two Administrative Support Vehicles, one Antique Engine, and two All Terrain Vehicle Quads.

As indicated in Table 7-2, PVSRS Stations No. 1 and No. 3 are the located 12 miles and 18 miles, respectively, from the project site. The PVFRS responds to both fire and emergency medical incidents (advanced life support) and currently has a response time of 15 to 20 minutes to the project site. The PVFRS Fire Chief has indicated that they

TABLE 7-1
CLOSEST FIRE STATIONS TO THE HHSEGS PROJECT SITE

Station	Station Address	Distance From Project Site (Miles)	Est. Response Time (Minutes)
Southern Inyo Fire Protection District	410 Tecopa Hot Springs Road, Tecopa, California	22	30-40 Minutes
Pahrump Valley Fire Station No. 3	3650 E. Kellogg, Pahrump, Nevada	12	15-20 Minutes
Pahrump Valley Fire Station No. 1	300 N. State Highway 160, Pahrump, Nevada	18	18-25 Minutes

Source: Based on Email Response from Chief Larry Levy, Southern Inyo Fire Protection District, dated February 15, 2012 and Verbal Communication with Chief Scott Lewis, Pahrump Valley Fire-Rescue Services, on April 19, 2012.

TABLE 7-2
CLOSEST FIRE STATIONS TO THE HHSEGS PROJECT SITE
ANNUAL EMERGENCY INCIDENT STATISTICS FOR 2011

Station No.	All Fires	False Alarms	Special Incidents	Hazardous Conditions	Public Service Assistance	All Rescue	Good Intent Calls	911 Transports	Intra-facility Transport	AMA	TOTAL
Southern Inyo Fire Protection District Station	---[a]	---[a]	---[a]	---[a]	---[a]	---[a]	---[a]	---[a]	---[a]	---[a]	70
Pahrump Valley Fire Stations No. 1 and 3	167	162	44	57	643	502	48	3,094	1,637	860	7,214
TOTAL											**7,284**

Source: Chief Larry Levy, Southern Inyo Fire Protection District, March 2012 and Pahrump Valley Fire-Rescue Services Monthly/Annual Report, December 2011.

[a] *No breakdown of the number of incidents by type was provided.*

routinely respond to Inyo County and are adequately staffed to do so with career and reserve fire fighters.

In addition to the PVFRS, Nye County Emergency Services, also located in Pahrump, Nevada, can respond to fire incidents. However, the SIFPD Fire Chief indicated that "None of our neighboring jurisdictions are staffed adequately enough to guarantee availability."

Table 7-2 provides the annual emergency incident statistics for the year 2011 for the three fire stations closest to the project site. As indicated in Table 7-2, these three stations responded to a total of 7,284 calls in the year 2011.

7.2 EMERGENCY MEDICAL SERVICES RESOURCES

As discussed above, the SIFPD provides emergency medical services (basic life support only) to the project site. Currently these services are provided from the office and station located at 410 Tecopa Hot Springs Road, Tecopa, California. The SIFPD estimates that the current response time to the project site is 30 to 40 minutes.

The current emergency medical services staffing for the SIFPD includes two Emergency Medical Technicians-Basic Life Support. These personnel are currently volunteers and respond on a 24-hour 7-day per week basis. The equipment used when responding to calls for emergency medical services consists of one Basic Life Support Ambulance. Although the SIFPD responded to a total of 70 calls in the year 2011, it is unknown how many of these calls were for emergency medical services and it is also unknown where in the service area the calls were generated.

As indicated above, the SIFPD is in the process of finalizing a mutual aid agreement with PVFRS located in Pahrump, Nevada, approximately 12 miles to the northeast. The PVFRS responds to emergency medical incidents (advanced life support) in the project vicinity and currently has a response time of 15 to 20 minutes to the project site. The PVFRS has five Advanced Life Support Ambulances and two Advanced Life Support Squads (4-wheel drive SUVs). As indicated in Table 7-2 above, in the year 2011, the PVFRS responded to 5,591 incidents related to emergency medical services (consisting of 911 transports, intra-facility transport, and AMA) within their service area.

Mercy Air helicopters are available to respond to calls for emergency medical services from Pahrump, Nevada, with a 10-minute response time and from Las Vegas, Nevada, with a 30 to 40 minute response time.

8.0 FIRE PROTECTION AND EMERGENCY MEDICAL SERVICES IMPACT ANALYSIS

8.1 PROJECT EFFECTS

The construction and operation of the HHSEGS would result in the addition of two solar thermal power plants within the service area for the SIFPD. Refer to Section 2.0 of this document for an overview of the proposed project including the facility technology, project characteristics, and the number of employees on the project site during the construction activities and the ongoing operation of the HHSEGS.

The project site is mostly vacant disturbed land with roads that were previously graded for an abandoned residential subdivision. The area around the project site is sparsely populated. The area to the south and east of the project site is mostly disturbed private land that has been partially developed for residential use. The area to the west and north is mostly undeveloped vacant land. According to the CAL FIRE 2008 Local Responsibility Fire Severity Maps, the project site is within a moderate fire hazard severity zone.

As discussed in Section 4.0 of this document, an extensive fire protection system is incorporated into the design of the HHSEGS. The fire protection system would be designed and maintained in accordance with the relevant NFPA guidelines and local code requirements as described in the Hidden Hills Fire Protection Design Basis provided as Appendix B to this document.

The Safety and Health Programs discussed in Section 5.0 of this document would be implemented during construction activities and the ongoing operation of the HHSEGS. In addition, to the Safety and Health Programs defined by the Applicant, the CEC will require typical Conditions of Certification that address worker safety issues and fire protection.

8.1.2 Fire Protection

The HHSEGS project site is located within the service area of the SIFPD. In addition, the SIFPD is in the process of finalizing a mutual aid agreement with the PVFRS located in Pahrump, Nevada, approximately 12 miles to the northeast. Table 7-1 in Section 7.0 of this document, provides information regarding the distance and response times for the SIFPD station and the two PVFRS stations closest to the project site. The SIFPD station, which is the first responder for both fire and emergency medical services (basic life support), is located approximately 22 miles from the project site and has a response time of 30 to 40 minutes. The PVSRS Stations Nos. 1 and No. 3 are the located 12 miles and 18 miles, respectively, from the project site. The PVFRS responds to both fire and emergency medical incidents (advanced life support) and currently has a response time of

15 to 20 minutes to the project site. The PVFRS Fire Chief has indicated that they routinely respond to Inyo County and are adequately staffed to do so with career and reserve fire fighters. In addition, Nye County Emergency Services, also located in Pahrump, Nevada, can respond to fire incidents. However, the SIFPD Fire Chief indicated that "None of our neighboring jurisdictions are staffed adequately enough to guarantee availability." Refer to Section 7.0 above for information on staffing and equipment at the SIFPD and PVFRS fire stations.

As discussed in Section 6.0 of this document, based on the potential hazards identified in the HHSEGS Fire and Emergency Services Risk Assessment (including compliance with the applicable standards, and the implementation of the fire protection systems and safety and health programs), the potential for risks as a result of the construction activities and operation of the HHSEGS that would require fire protection would be extremely low. For an example, the Ivanpah Solar Energy System under construction in San Bernardino County has only resulted in five calls since construction commenced in October 2010 and its construction activities and workforce are similar to that of the HHSEGS. Therefore, the potential increase in the demand for fire protection services would be considered less than significant.

In the event that fire protection services would be required at the project site, under the mutual aid agreement, the PVFRS would be the appropriate responding agency since their response time would be 15 to 20 minutes and they have adequate staffing and equipment. Under the mutual aid agreement, the PVFRS could bill the HHSEGS on a per call basis per Health and Safety Code Section 13009. Therefore, no significant impact to fire protection service providers would be anticipated.

If there were an incident during construction or operation of the HHSEGS, management personnel would contact 9-1-1 via cell phone because there would be no phone service by a landline at the project site. Typically, the 9-1-1 calls received in California would go to the California Highway Patrol and then be transferred to the appropriate agency based on the type of incident. Since the project site is located in an isolated area along California-Nevada state line that is bounded by mountain ranges to the northwest, west, and south and the location of the closest cell tower is at the intersection of Tecopa Road and Nevada SR 160 to the northeast in Nevada, it is anticipated that the majority of the 9-1-1 calls originated on the project site would go to Nevada. Nevada does not have a central system for receiving 9-1-1 calls statewide, so calls go to the County Sheriff in the area of the cell tower. A call from HHSGS could go to the California Highway Patrol or Clark County or Nye County in Nevada, depending on the location of the call on the project site and the location of the receiving tower. This could result in an issue initiating a response from the appropriate service provider and delay the response time. Therefore, the consultant recommendations provided in Section 9.0 of this document shall be implemented to address this issue.

8.1.3 Emergency Medical Services

As discussed in Section 6.0 of this document, based on the potential hazards identified in the HHSEGS Fire and Emergency Services Risk Assessment (including compliance with the applicable standards, and the implementation of the fire protection systems and safety and health programs), the potential for risks as a result of the construction activities and operation of the HHSEGS that would generate a demand for responses to an emergency medical incident would be extremely low. Therefore, the potential increase in the demand for emergency medical services would be considered less than significant.

In addition, in the event that an emergency medical incident occurs at the HHSEGS during construction, an onsite Nurse (provided by the Project Owner) would assess the incident and triage affected personnel to determine if secondary response personnel are needed. If required, the Nurse shall direct other personnel to contact 9-1-1. With the request made per Inland Counties Emergency Medical Agency (ICMEA) policies, a ground or air ambulance would be dispatched to the project site. If ground transportation is used, the injured/ill employee would be transported to the Desert View Regional Medical Center located at 360 S. Lola Lane, Parump, Nevada, 89048. If the injured/ill employee is transported by air ambulance, the employee would be taken to the appropriate medical facility as deemed necessary by the attending medical personnel. The SIFPD could bill the HHSEGS on a per call basis for ambulance service if so dispatched from SIFPD. Under the mutual aid agreement, the PVFRS could also bill the HHSEGS on a per call basis for ambulance service if so dispatched from PVFRS to the project site. Therefore, no significant impact to emergency medical service providers would be anticipated.

As discussed above, a 9-1-1 call from HHSGS could go to the California Highway Patrol or Clark County or Nye County in Nevada, depending on the location of the call on the project site and the location of the receiving tower. This could result in an issue initiating a response from the appropriate emergency medical service provider and delay the response time. Therefore, the consultant recommendations provided in Section 9.0 of this document shall be implemented to address this issue.

Section 6.0 of the HHSEGS Fire and Emergency Services Risk Assessment provides an analysis of the potential for hazards as a result of off-site vehicle accidents. Table 6-4 of the HHSEGS Fire and Emergency Services Risk Assessment provides the potential additional accidents on the roadways in Inyo County within the vicinity of the project site with construction and operation of the HHSEGS. As a result of the additional average daily trips generated by construction worker traffic during the construction phase of the HHSEGS and accident rate data, there is the potential for five additional vehicle accidents to occur per year on the surrounding roadways in Inyo County. In addition, during the ongoing operation of the HHSEGS, there is the potential for one additional vehicle accident on the surrounding roadways in Inyo County. Therefore, the addition of the HHSEGS to the SIFPD service area would result in an insignificant increase in responses due to vehicle accidents on the roadways in the project vicinity.

8.1.3 Technical Rescue

The potential for risks as a result of the construction activities and operation of the HHSEGS that would generate a demand for responses to technical rescue incidents, including high angle rescue, low angle rescue, and confined space rescue, would be extremely low. Therefore, the potential increase in the demand for fire protection services would be considered less than significant. In order to ensure that the demand for high angle rescue, low angle rescue, and confined space rescue on the HHSEGS project site would be less than significant, the incorporation of the consultant recommendations provided in Section 9.0 of this document shall be implemented.

In addition, the SIFPD does not have the appropriate staff training in order to respond to a technical rescue incident. Therefore, the addition of the HHSEGS to the SIFPD service area would not require responses to technical rescue incidents by the SIFPD. However, under the mutual aid agreement pending between the SIFPD and the PVFRS, if required, PVFRS personnel with NFPA 1006 and NFPA 1670 level of training would respond to a technical rescue incident. Under the mutual aid agreement, the PVFRS could bill the HHSEGS on a per call basis for a technical rescue response.

As discussed above, a 9-1-1 call from HHSGS could go to the California Highway Patrol or Clark County or Nye County in Nevada, depending on the location of the call on the project site and the location of the receiving tower. This could result in an issue initiating a response from the appropriate emergency medical service provider and delay the response time. Therefore, the consultant recommendations provided in Section 9.0 of this document shall be implemented to address this issue.

8.2 CUMULATIVE EFFECTS

As demonstrated in the analysis provided in this document, with the design of the HHSEGS fire protection system, the implementation of the Safety and Health Programs, and the consultant recommendations during the construction and the ongoing operation of the proposed project, the potential increase in demand for fire protection and emergency medical services would be considered less than significant. In addition, there are no projects of a similar scope and nature proposed within the service area of the SIFPD. Therefore, the construction and operation of the HHSEGS would not contribute to a significant cumulative impact to fire protection and emergency medical services.

9.0 RECOMMENDATIONS

The consultant for the preparation of this document provides the following recommendations that shall be implemented during the construction and ongoing operation of the HHSEGS:

Potential Technical Rescue Situations

- During construction activities on the HHSEGS project site that require the type of situations addressed by California Department of Safety and Health (Cal/OSHA) Standards Part 1910, Occupational Safety and Health Administration Safety and Health Regulations, the contractor shall be required to provide evidence that their personnel with training based on federal and state standards and the equipment manufacturer's requirements will be available on-site for the extent of the construction activity.

- During operation of the HHSEGS, the daily on-site operational and maintenance personnel for the solar power tower and solar receiving steam generator shall be required to have training based on federal and state standards and equipment manufacturer's requirements.

- During operation of the HHSEGS, the contractor to perform the annual maintenance for the solar power tower and other areas that require work in confined space shall be required to provide evidence that their on-site personnel have training based on federal and state standards and the equipment manufacturer's requirements.

Mechanism to Address 9-1-1 Calls

- Prior to the initiation of construction activities on the HHSEGS project site, a mechanism shall be in place to address the use of cellular service to contact the fire protection, emergency medical, and technical rescue service providers.

- Prior to the operation of the HHSEGS, a mechanism shall be in place to address the use of cellular service to contact the fire protection, emergency medical, and technical rescue providers.

Appendix A

MAPS AND SITE PLAN

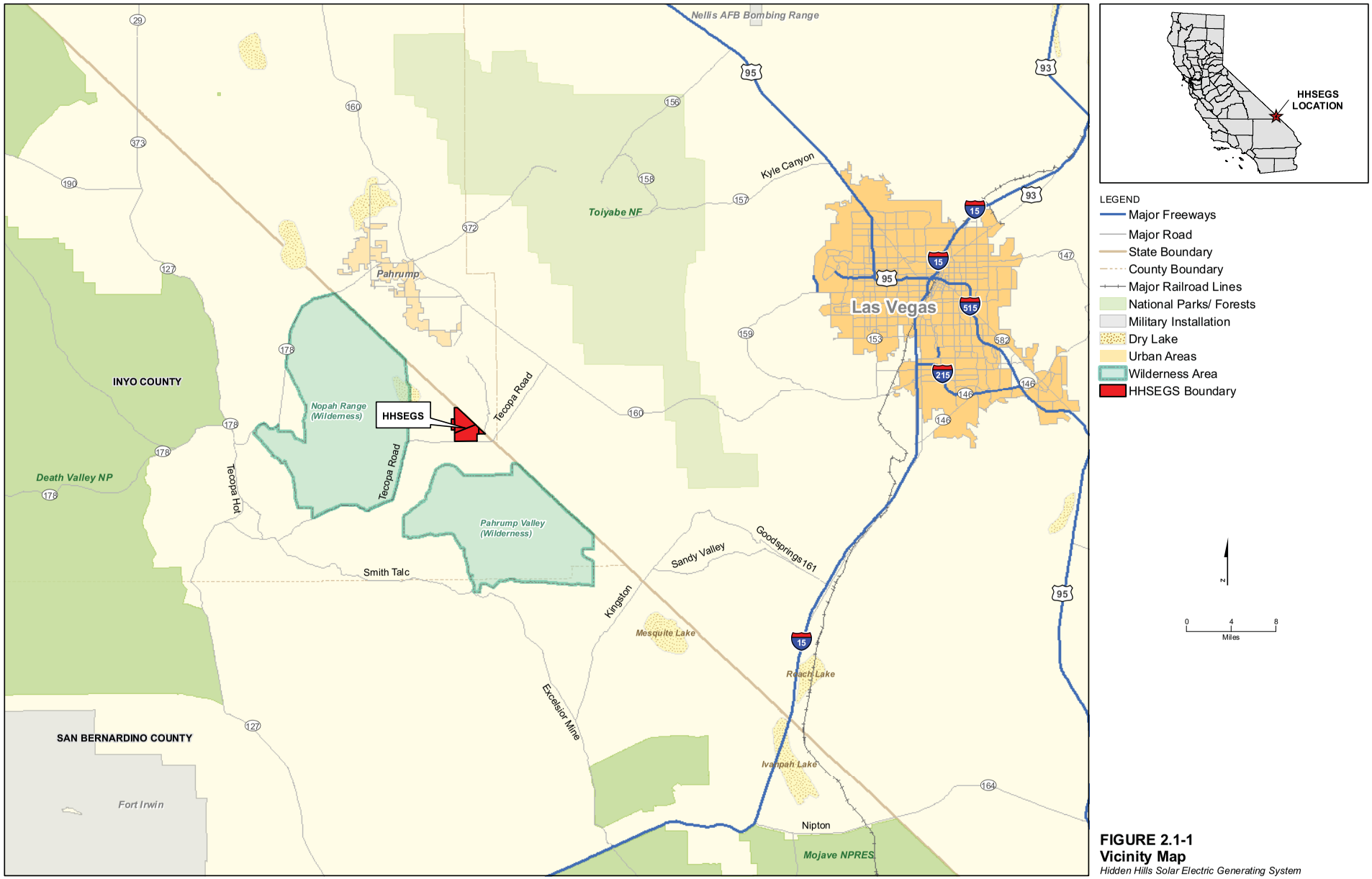
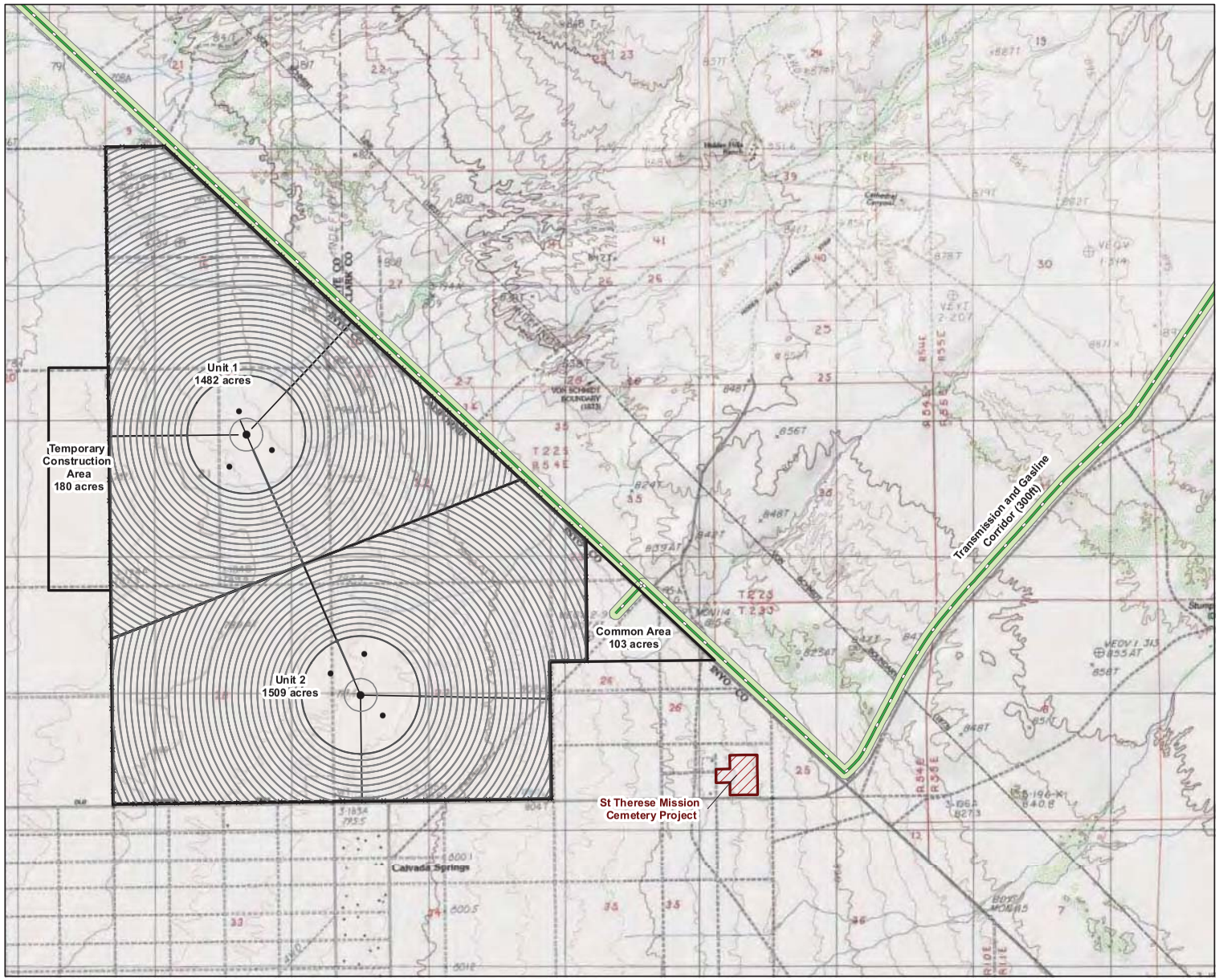


FIGURE 2.1-1
Vicinity Map
Hidden Hills Solar Electric Generating System



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

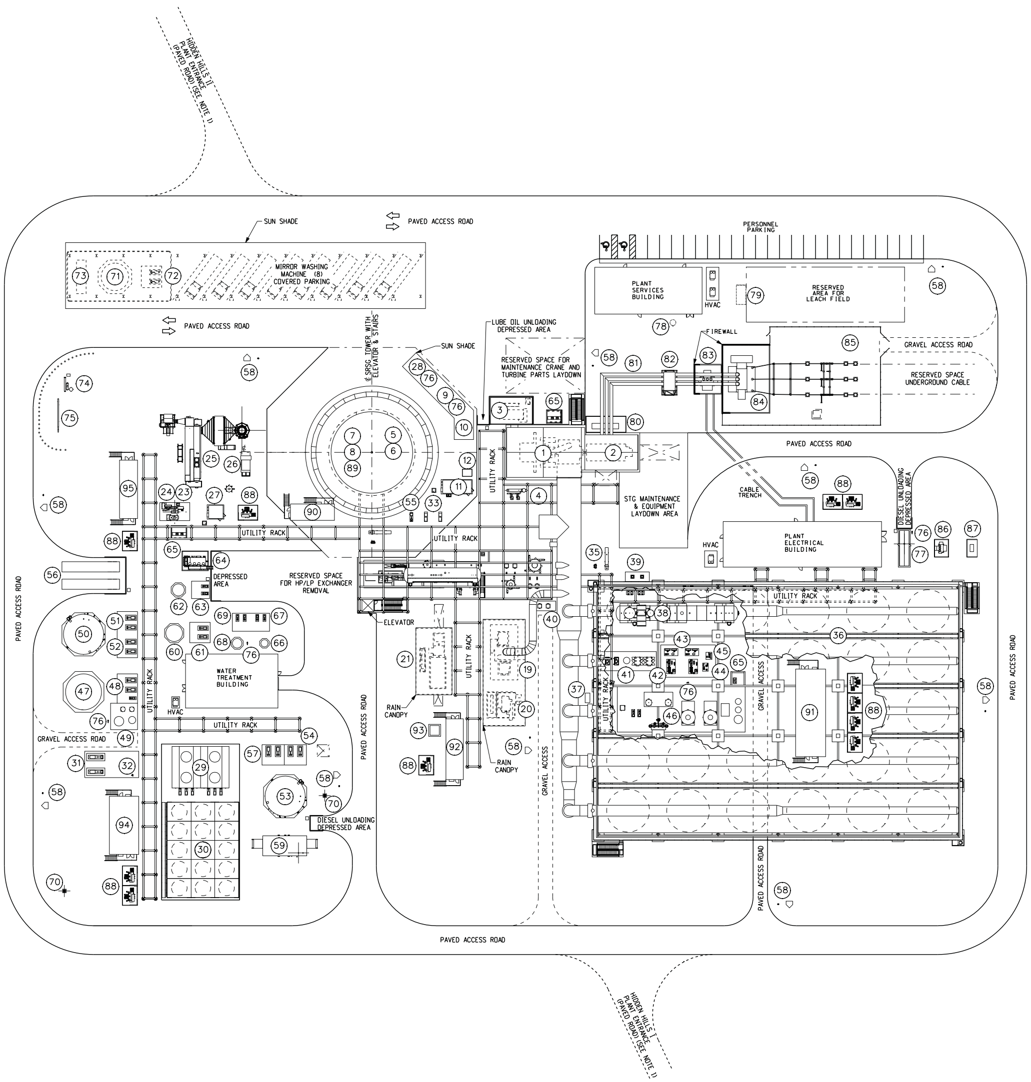
0 1,200 2,400
Feet

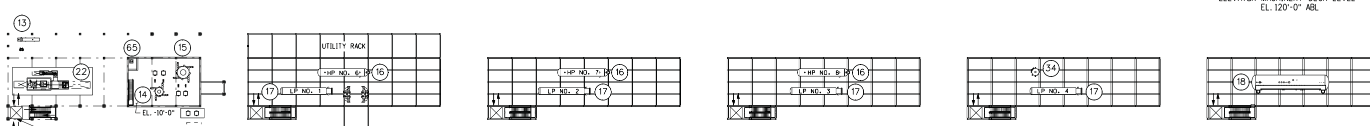
Figure 1
Hidden Hills Site and Propsed Transmission Lines
Hidden Hills

NA_FORMATS.CEL AC-ESTD_NA 1/11/12

NOTES:

1. POWER BLOCK ARRANGEMENT FOR HIDDEN HILLS I AND II TO BE IDENTICAL WITH THE EXCEPTION OF PLANT ENTRANCE AND RADIAL DIRT ROAD LOCATIONS. SEE APPROPRIATE CIVIL DRAWINGS.





GROUND LEVEL EL. 0'-0" ABL BELOW HEATER BAY STRUCTURE

HP / LP HEATER DECK LEVEL EL. 20'-0" ABL (OPERATING DECK LEVEL)

HP / LP HEATER DECK LEVEL EL. 50'-0" ABL

HP / LP HEATER DECK LEVEL EL. 70'-0" ABL

LP HEATER DECK LEVEL EL. 90'-0" ABL

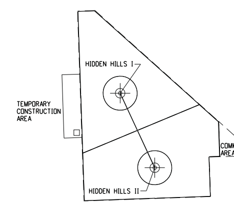
DEAERATOR DECK LEVEL EL. 110'-0" ABL

ELEVATOR MACHINERY DECK LEVEL EL. 120'-0" ABL

0 60 120 180 240FT

ITEM	DESCRIPTION
1	STEAM TURBINE
2	GENERATOR
3	LUBE OIL UNIT
4	GLAND STEAM CONDENSER
5	SOLAR RECEIVER STEAM GENERATOR (SRSG)
6	BOILER CIRCULATION PUMPS (4) (SRSG)
7	SRSG FLASH TANK (TOWER)
8	SRSG BLOWDOWN TANK (TOWER)
9	SRSG CHEMICAL FEED EQUIPMENT
10	NITROGEN STORAGE
11	SRSG STEAM & WATER ANALYSIS SAMPLING SYSTEM (SWAS)
12	BYPASS VALVE HYDRAULIC SKID
13	SRSG BLOWDOWN COOLER
14	INTERNAL DRAIN TANK & PUMPS (2)
15	EXTERNAL DRAIN TANK & PUMPS (2)
16	HP FEEDWATER HEATERS (3)
17	LP FEEDWATER HEATERS (4)
18	DEAERATOR
19	MAIN BOILER FEEDWATER PUMP (TURBINE DRIVEN)
20	MAIN BOILER FEEDWATER PUMP L.O. PACKAGE
21	BACKUP BOILER FEEDWATER PUMP (MOTOR DRIVEN)
22	STARTUP BOILER FEEDWATER PUMP (MOTOR DRIVEN)
23	NIGHT PRESERVATION BOILER (NPB)
24	NIGHT PRESERVATION BOILER FEEDWATER PUMPS (2)
25	AUXILIARY BOILER
26	AUXILIARY BOILER FEEDWATER PUMPS (2)
27	AUX BOILER STEAM & WATER ANALYSIS SAMPLING SYSTEM (SWAS)
28	NPB & AUX BOILER CHEMICAL FEED EQUIPMENT
29	WET SURFACE AIR COOLER (WSAC)
30	DRY FIN-FAN COOLERS

ITEM	DESCRIPTION
31	CLOSED COOLING WATER (CCW) PUMPS (2)
32	CCW CHEMICAL ADDITION TANK
33	CCW BOOSTER PUMPS (2)
34	CCW HEAD TANK
35	BLOWDOWN / CONDENSATE HEAT EXCHANGER
36	AIR COOLED CONDENSER (ACC)
37	ACC WASH WATER SYSTEM SKID
38	CONDENSATE COLLECTION TANK
39	CONDENSATE PUMPS (2)
40	STEAM DUCT DRAIN PUMPS (2)
41	PLANT AIR EQUIPMENT
42	CONDENSER VACUUM PUMPS (2)
43	CONDENSER VACUUM PUMPS FIN FAN COOLERS (2)
44	NIGHT TIME VACUUM PUMP
45	NIGHT TIME VACUUM PUMP FIN FAN COOLER
46	CONDENSATE POLISHER EQUIPMENT
47	DEMINERALIZED WATER STORAGE TANK
48	DEMINERALIZED WATER TRANSFER PUMPS (2)
49	DEMINERALIZER SYSTEM EQUIPMENT
50	TREATED WATER STORAGE TANK
51	TREATED WATER TRANSFER PUMPS (2)
52	DEMINERALIZER FEED PUMPS (2)
53	SERVICE / FIRE WATER STORAGE TANK
54	SERVICE WATER TRANSFER PUMPS (2)
55	SERVICE WATER BOOSTER PUMP (1)
56	RAW WATER TREATMENT TRAILERS (2)
57	RAW WATER TREATMENT FEED PUMPS (2)
58	FIRE HYDRANT & HOSE HOUSE (10)
59	FIRE PUMPS MODULE (ELECTRIC, DIESEL & JOCKEY)
60	WASTEWATER COLLECTION TANK
61	WASTEWATER FEED PUMPS (2)
62	WASTEWATER RESIDUE TANK
63	WASTEWATER RESIDUE PUMPS (2)
64	OILY WATER SEPARATOR
65	SUMP PUMPS
66	POTABLE WATER STORAGE TANK
67	POTABLE WATER SUPPLY PUMPS (2)
68	POTABLE WATER TREATMENT SYSTEM FEED TANK
69	POTABLE WATER FEED PUMPS (2)
70	WELL PUMP (2)
71	MIRROR WASH WATER STORAGE TANK
72	MIRROR WASH WATER FILLING PUMPS (2)
73	DIESEL FUEL STORAGE TANK
74	FUEL GAS FILTRATION/HEATING EQUIPMENT
75	FUEL GAS PIG RECEIVER / LAUNCHER (BY SUBCONTRACTOR)
76	EMERGENCY EYEWASH & SHOWER
77	EMERGENCY DIESEL GENERATOR
78	SANITARY LIFT STATION (UNDERGROUND)
79	SEPTIC TANK & LEACH FIELD
80	EXCITATION CONTAINER
81	ISOPHASE BUS DUCT
82	GENERATOR CIRCUIT BREAKER
83	UNIT AUXILIARY TRANSFORMER
84	GENERATOR STEP-UP TRANSFORMER
85	230KV PLANT SUB-STATION
86	STATION SERVICE TRANSFORMER
87	24.9kV BREAKER
88	MCC OIL FILLED TRANSFORMER (11)
89	ELECTRICAL EQUIPMENT MODULE FOR SRSG (TOWER)
90	ELECTRICAL EQUIPMENT MODULE FOR SRSG
91	ELECTRICAL EQUIPMENT MODULE FOR ACC
92	ELECTRICAL EQUIPMENT MODULE FOR BFP
93	LIQUID TO AIR REMOTE HEAT EXCHANGER (VFD)
94	ELECTRICAL EQUIPMENT MODULE FOR FIN FAN/WSAC & WATER TREATMENT AREA
95	ELECTRICAL EQUIPMENT MODULE FOR AUXILIARY BOILER



KEY PLAN

TRUE NORTH
N
PLANT NORTH

SITE LOCATION & ROTATION

HIDDEN HILLS I
TOWER LOCATION: N. 99,052.05 E. 30,426.00
ROTATION: 0° CLOCKWISE

HIDDEN HILLS II
TOWER LOCATION: N. 92,842.05 E. 33,310.00
ROTATION: 0° CLOCKWISE

PRELIMINARY

NO.	DATE	REVISIONS	BY	CHK	DES SUPV	ENGR.	PROJ ENGR	APPR
A		ISSUED FOR INFORMATION	AKS					

SCALE AS SHOWN DATE 09SEP11 DESIGNED AKS DRAWN AKS CHIEF ENGR.

CBO/AHJ APPROVAL

BECHTEL POWER CORP.
DEDICATED TO SAFETY EXCELLENCE - ZERO ACCIDENTS
FREDERICK, MARYLAND

HIDDEN HILLS
SOLAR ELECTRIC GENERATING SYSTEM

TYPICAL POWER BLOCK
PLOT PLAN

JOB NO.	DRAWING NO.	REV.
25750	000-P1-0010-00001	A

PE STAMP

34"X44"E SIZE

Appendix B

HIDDEN HILLS SOLAR ENERGY GENERATING SYSTEM
FIRE PROTECTION DESIGN BASIS

HIDDEN HILLS Solar Electric Generating Facility (HHSEGS)

Fire Protection Design Basis

The HHSEGS consists of two 250 MW (nominal) Power Plants and one Common Area. Each Power Plant and Common Area will have a fire water storage tank and fire pumps to supply the fire water loop that supplies the yard hydrants, hose stations, water spray, and sprinkler systems. The system will be designed to supply the design water demand for automatic suppression systems plus flow for fire hydrants and hose stations in accordance with California Building Code (CBC 2010)/NFPA requirements.

1.0 WATER SUPPLY

Each service/fire water storage tank (Power Plant) and fire water storage tank (Common Area) will include a 2-hour dedicated fire water capacity. The suction piping for service water demand will be taken from above the 2-hour storage volume reserved for fire protection water at the bottom of the tank. Two main, one-hundred percent capacity, fire water pumps (one electric-motor driven and one diesel-engine driven) and a jockey pump to maintain system pressure will be provided at each Power Plant and Common Area. The fire pumps will take suction from the service/fire water storage tank. Automatic start for the fire pumps will be initiated by a pressure switch in accordance with CBC (2010)/NFPA practice. Once started, the fire pump(s) will continue to run until manually stopped at the associated local pump controller. Fire pumps will be sized to provide the design water demand to the automatic fire suppression system plus 500 gpm for a fire hydrant or hose station.

The underground fire main headers will be high-density polyethylene (HDPE) pipe and will loop around their respective Power Plant and Common Area, with service main branch lines to auxiliary structures and facilities as necessary. The main headers will serve yard hydrants and hose stations. Fire hydrants will be spaced at approximately 250-foot intervals around the fire loop. Fire hydrants will be located in accordance with NFPA 24 and local fire codes. The hydrants will be dry barrel type and include threaded outlet connections to match local fire department hose threads. Applicable hydrants, valving, and other appurtenances required by state and local codes will be included. Fire hose houses and hoses will be provided. Each hose house shall be equipped with 200-feet of 1 ½ inch hose and accessories per CBC (2010)/NFPA 24.

The fire water distribution system will incorporate sectionalizing valves so that a single failure in the respective yard loop piping (other than the supply piping) will not affect service to both suppression systems and yard hydrants serving the same area. The fire water distribution system will incorporate isolation valves so that the automatic suppression system can be taken out of service without affecting standpipes/hose stations serving the same area. Valves requiring periodic testing will be accessible. Valves will be arranged and installed in accordance with NFPA 24 and NFPA 13 requirements, as applicable. The valves will be administratively supervised/inspected in accordance with NFPA 25. Fire protection system piping will be hydrostatically tested in accordance with NFPA requirements.

2.0 FIRE PUMP HOUSE

The fire pumps will be skid mounted in a structural steel metal enclosure complete with all furnished equipment, piping, valves, controllers, panels, lights (interior, exterior and emergency), receptacles, etc. on a single enclosed, prewired and fabricated skid complete with heating, ventilation (with dust louvers on intake) and lighting etc designed to permit a single lift during transit and installation on the foundation. The enclosure will have a rated fire wall separating the diesel and electric fire pumps.

3.0 CODES AND STANDARDS

The fire protection shall be in accordance with generally accepted fire protection engineering practices and consistent with previously approved approaches to fire protection for other power plants throughout the US. This design approach will require local and/or state review and approval and may require code clarifications or design variances where general code requirements exceed typical industry design practice for power generating facilities.

The fire protection system will be provided in accordance with code requirements to mitigate fire hazards, reduce potential property loss and protect personnel, as approved by the authority having jurisdiction (AHJ). The fire protection system design generally will conform to NFPA 850 provisions and recommendations, except for the following:

- ♦ Section 4.5, Fire Protection Design Basis Document - A fire risk evaluation will be performed as part of the design development. A formal fire risk evaluation document will not be issued (unless required by Chief Building Official (CBO)).
- ♦ Section 5.1.1, Fire Area Determination - Detailed drawings showing plant fire areas and fire boundaries will not be issued (unless required by CBO).
- ♦ Section 5.1.1.4, Fire Barriers - In general, spatial separation will be provided for fire hazards. Fire-rated barriers will be provided only in a limited number of locations where physical separation cannot be achieved (e.g., transformer fire walls or walls separating office areas from fire hazards, fire pump house).
- ♦ Section 5.1.5, Indoor Transformers - All indoor transformers will be the dry type and less than 35 kV rating. Therefore, rated fire barriers or suppression systems will be not required for this equipment.
- ♦ Section 5.4.1.2.2, Heat Vents - The boiler does not require smoke/heat venting. The turbine enclosure roof will have fusible-link-operated smoke/heat vents only if provided by the STG Supplier.
- ♦ Section 5.4.1.3, Smoke Vents - Dedicated smoke venting systems are not required in plant control rooms or switchgear rooms due to their small size.
- ♦ Section 5.5.2, Drainage and Curbing - Oil-filled equipment, containers, and tanks will be curbed. A floor trench will be installed on the lowest level of such containment. The trench will be sized to accommodate the entire volume of oil contained in such equipment, containers, or tanks and sprinkler discharge.
- ♦ Section 7.7.2, Hydraulic Control System - The steam turbine will use a fire-resistant hydraulic fluid. Therefore, automatic fire suppression system coverage is not required for this equipment.

♦ Section 7.7.3.1, Turbine Lubricating Oil Systems - Listed fire-resistant lubricating oils are not available for steam turbines in this size range. Since the lubricating oil is flammable, an automatic suppression system will be provided to cover the areas below the turbine operating floor that are subject to oil flow for all areas containing oil piping and for 20 feet beyond the piping.

♦ Section 7.7.3.4, Turbine Lubricating Oil Curbing - See clarification for Section 5.5.2.

♦ Section 7.7.3.8, Lubricating Oil Pumps - The lube oil pump skid will be covered by an automatic suppression system. It is not feasible to separate or protect electrical cabling for the ac and dc oil pumps since they will be located on the same pump skid.

♦ Section 7.8.2, Cable Tunnels - Cable tunnels will not be used. There may be some cable pits beneath electrical equipment rooms. Cable within these areas will have fire-retardant insulation.

♦ Section 7.8.3.3, Electrical Cables - It is not practical to provide automatic suppression systems or fire-retardant coatings for electrical cable trays. Cable trays will be routed to avoid ignition sources or flammable liquids where possible. Medium and low voltage cable entering buildings will have flame-retardant insulation meeting the requirements of the IEEE-383 vertical flame test.

Sprinkler and fixed spray systems will be designed and installed in accordance with NFPA 13 and NFPA 15, respectively.

NFPA codes and standards listed in the CBC (2010) will be used (NFPA 10,13,14,15,16,20,22,24,30,37,72, 80, 85 and 2001), plus the following:

NFPA 45	Standard on Fire Protection for Laboratories Using Chemicals
NFPA 55	Compressed Gases and Cryogenic Fluids Code
NFPA 69	Standard on Explosion Prevention Systems
NFPA 75	Standard for the Protection of Information Technology Equipment
NFPA 496	Standard for Purged and Pressurized Enclosures for Electrical Equipment
NFPA 497	Recommended Practice For the Classification of Flammable Liquids, Gases, or Vapors, and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas
NFPA 780	Standard for the Installation of Lightning Protection Systems
NFPA 850	Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations
NFPA 1961	Standard on Fire Hose
NFPA 1963	Standard for Fire Hose Connections
NFPA 1964	Standard for Spray Nozzles

4.0 FIRE PROTECTION

Automatic and manual fire protection systems will be provided as necessary for protection in the event of a fire. The fire protection system will incorporate a fire alarm system with means to automatically or manually detect and suppress fires until they can be extinguished by qualified onsite or offsite personnel.

4.1 SUPPRESSION AND DETECTION SYSTEMS

Sprinkler and fixed spray systems will be designed and installed in accordance with CBC (2010)/NFPA. Fire protection systems for the Power Plant will be provided as stated in the table below.

Fire Protection Systems for Each Power Plant

	Automatic Suppression					**Manual**				**Alarm System**
Area Receiving Fire Protection	**Wet Pipe**	**Water Deluge**	**Gaseous System**	**Foam Deluge**	**Foam Preaction**	**Portable Extinguisher**	**Standpipe**	**Yard Hydrant**	**Pull Station**	**Fire Detection**
STG bearings					X					X
STG enclosure				X		X		X	X	X
STG lube oil reservoir				X				X		X
Boiler Feedwater Pump Turbine (BFPT) lube oil reservoir				X				X		X
Control room and control equipment room in Plant Services building *(Note)*			X			X		X	X	X
Plant electrical building			X			X		X	X	X
Electrical equipment module (PDC)						X		X	X	X
Main and auxiliary transformers		X						X	X	X
Station service transformer								X		X
ACC/MCC transformers								X		X
Solar tower and SRSG						X				X
Fire pump house	X							X		X
Water treatment building	X					X		X	X	X

Note: Clean Agent Fire Suppression Systems will be provided for control equipment and control rooms in the Plant Services building and the electrical rooms of the plant electrical building and the water treatment building. The systems should consist of, but not limited to, the agent, agent storage containers, agent release valves, fire detectors, fire detection system (wiring control panel, actuation signaling), agent delivery piping and agent dispersion nozzles.

Fire protection systems for the Common Area will be provided as stated in the table below.

Common Area Fire Protection Systems

	Automatic Suppression					Manual				Alarm System
Area Receiving Fire Protection	**Wet Pipe**	**Water Deluge**	**Gaseous System**	**Foam Deluge**	**Foam Preaction**	**Portable Extinguisher**	**Standpipe**	**Yard Hydrant**	**Pull Station**	**Fire Detection**
Admin/control building -maintenance/ warehouse areas	X					X		X	X	X
Admin/control building -central control room, control equipment room, battery room, and electrical room *(Note)*			X			X		X	X	X
Admin/control building -other offices only	X					X		X	X	X
MCC transformers								X		X
Fire pump house	X							X		X
Water treatment building (except for electrical room)	X					X		X	X	X
Water treatment building electrical room (*Note)*			X			X		X	X	X
Heliostat assembly building	X					X		X	X	X
Mirror Wash Machine (MWM) maintenance shed						X		X		
Switchyard control Electrical Equipment Module (EEM)						X		X	X	X

Note: Clean Agent Fire Suppression Systems will be provided for control equipment and control rooms in the Admin/Control building, and the electrical rooms of the water treatment building. The systems should consist of, but not limited to, the agent, agent storage containers, agent release valves, fire detectors, fire detection system (wiring control panel, actuation signaling), agent delivery piping and agent dispersion nozzles.

Augmenting the fixed fire protection system, portable fire extinguishers will be located throughout the Power Plant and Common Area. These extinguishers will be sized, rated, and spaced in accordance with CBC (2010)/NFPA. A 100-pound wheeled handcart CO_2 extinguisher will be provided in the turbine area.

A proprietary, addressable, smoke and fire detection system will be provided for the project, with local structure fire alarms, automatic fire detectors, and fire signaling panels as required by design codes and in accordance with CBC (2010)/NFPA. The main fire panel will be located in the Common Area central control room (CCR) and will be connected to the Power Plant local control room (LCR) panels. The LCR fire panel will have non-redundant communication with the distributed control system (DCS) and, if applicable, hardwired shutdown signals to the Emergency Shutdown (ESD) System. A DCS gateway will be provided to interface with the Fire Alarm Panel, with the main electrical distribution systems and process systems located at the common area and packaged equipment of the common area.

4.2 FIRE BARRIERS, FIRE PROOFING AND FIRE SEALS

The CBC occupancy use group of the Services Building and Electrical Building in each Plant and the Admin/Control Building in the Common Area are considered to be Factory Industrial (F-1). The structure will consist of Type II, nonrated, unprotected construction. Other than the walls surrounding the LCR, the CCR, the control equipment rooms, IT/ media room, oil storage rooms (if any), cable pits, battery room, solar tower stair enclosure, and electrical room, no other fire walls or structural steel fireproofing will be included.

Wherever possible, through-barrier penetrations in fire barriers will have commercially available rated closure systems or seals. Barrier penetrations having design characteristics exceeding the limits of commercially available qualified closure systems or seals will have closure systems or seals that use materials similar to qualified configurations. Alternatively, the barrier and penetration design will be evaluated and qualified by engineering judgment.

Concrete transformer firewalls will be provided between oil-filled transformers and adjacent structures and equipment as required by NFPA 850. Firewall partitions will be provided between adjacent transformers and where required to protect structures within 50 feet of the generator step-up (GSU) transformer.

Fire separation walls and floors will be provided in accordance with code requirements. Fire doors and frames will conform to CBC (2010)/NFPA for the class of door furnished.

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
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APPLICATION FOR CERTIFICATION
FOR THE *HIDDEN HILLS SOLAR ELECTRIC GENERATING SYSTEM*

DOCKET NO. 11-AFC-02

PROOF OF SERVICE
(Revised 5/1/2012)

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DECLARATION OF SERVICE

I, Mary Finn, declare that on May 8, 2012, I served and filed copies of the attached Hidden Hills Data Response, Set 1C-3, dated May 8, 2012. This document is accompanied by the most recent Proof of Service list, located on the web page for this project at: www.energy.ca.gov/sitingcases/hiddenhills/index.html.

The document has been sent to the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit or Chief Counsel, as appropriate, in the following manner:

(*Check all that Apply*)

For service to all other parties:

__x__ Served electronically to all e-mail addresses on the Proof of Service list;

____ Served by delivering on this date, either personally, or for mailing with the U.S. Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses NOT marked "e-mail preferred."

AND

For filing with the Docket Unit at the Energy Commission:

__x__ by sending an electronic copy to the e-mail address below (preferred method); *OR*

____ by depositing an original and 12 paper copies in the mail with the U.S. Postal Service with first class postage thereon fully prepaid, as follows:

CALIFORNIA ENERGY COMMISSION – DOCKET UNIT
Attn: Docket No. 11-AFC-2
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

OR, if filing a Petition for Reconsideration of Decision or Order pursuant to Title 20, § 1720:

_____ Served by delivering on this date one electronic copy by e-mail, and an original paper copy to the Chief Counsel at the following address, either personally, or for mailing with the U.S. Postal Service with first class postage thereon fully prepaid:

California Energy Commission
Michael J. Levy, Chief Counsel
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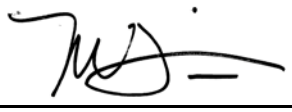
I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.



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