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Subject: **PALEN SOLAR HOLDINGS, LLC'S FIRE AND EMERGENCY SERVICES RISK ASSESSMENT**
PALEN SOLAR ELECTRIC GENERATING SYSTEM
DOCKET NO. (09-AFC-7C)

Enclosed for filing with the California Energy Commission is the electronic version of **PALEN SOLAR HOLDINGS, LLC'S FIRE AND EMERGENCY SERVICES RISK ASSESSMENT**, for Palen Solar Electric Generating System (09-AFC-7C).

Sincerely,

Marie Fleming

FIRE AND EMERGENCY SERVICES RISK ASSESSMENT

In support of the

PETITION TO AMEND

for the

PALEN SOLAR ELECTRIC GENERATING SYSTEM

(09-AFC-7C)

Submitted to the:

California Energy Commission

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PALEN SOLAR HOLDINGS, LLC

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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 Palen Solar Electric Generating System (PSEGS).

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 PSEGS and the safety and health programs defined by the applicant in the Petition to Amend the California Energy Commission (CEC) License. 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 PSEGS as compared to the original Approved solar trough project. 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 PSEGS 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 PSEGS that would require fire protection and emergency medical services.

2.0 PROJECT DESCRIPTION AND SETTING

2.1 LOCATION AND SETTING

The CEC issued a License to Solar Trust of America for its Palen Solar Power Project (PSPP or Approved Project) on December 15, 2010 (Order No. 10-1215-19), authorizing construction of a nominal 500 megawatt (MW) concentrating solar thermal electric power generating facility using solar parabolic trough technology, located in the Southern California inland desert, approximately 10 miles east of the small community of Desert Center, in eastern Riverside County, California. The CEC subsequently approved a petition to amend the Decision to transfer ownership of the Approved Project to Palen SEGS I, LLC, a wholly owned, indirect subsidiary of Palen Solar Holdings, LLC which is now jointly owned by BrightSource Energy, Inc. and Abengoa Solar, LLC (Order No. 12-0711-3). To enhance the commercial feasibility of the project, Palen Solar Holdings, LLC (PSH or Applicant) proposes to utilize a different concentrating solar thermal technology. PSH also changed the project name from PSPP to PSEGS. A Petition to Amend the License was filed in December 2012 to authorize the use of the different concentrating solar thermal technology at PSEGS (Modified Project).

The PSEGS will continue to utilize concentrating solar thermal technology to generate electricity but will use different proprietary technology. With this different technology, a field of mirrors (or heliostats) reflects energy from the sun onto a solar power boiler, located on the top of a concrete tower. As water flows through the solar power boiler (solar receiver steam generator or SRSG), the solar energy is converted to superheated steam. The steam is then fed to a conventional Rankine cycle steam turbine generator where electricity is produced.

As with the Approved Project, the Modified Project nominal output will remain at 500 megawatts (MW). The Project will consist of two adjacent, identical and independent 250 MW plants, Unit #1 and Unit #2, with each Unit sharing common facilities. Each of the 250 MW Units will have its own solar field, comprised of heliostats arranged in concentric circles around the tower, a dedicated tower and solar receiving steam generator, and a dedicated power block. The power block will be located centrally within the solar field. Each power block will have its own administration, control, warehouse, maintenance, and lab buildings; auxiliary boiler; steam turbine generator; an air-cooled condenser; onsite transmission lines and electrical system; and various auxiliary equipment. The common facilities shared by the two plants will include a combined administration, control, maintenance and warehouse building, evaporation ponds, groundwater wells, water treatment plant, and a common switchyard.

The project site is within a "Non-High Fire Hazard Severity Zone" according to the *Approved Very High Fire Hazard Severity Zones and Local Responsibility Areas* map, dated December 24, 2009, prepared by the State of California Department of Forestry and Fire Protection (CAL FIRE) and adopted by the County of Riverside.

2.2 PROJECT CHARACTERISTICS

The Modified Project will have a nominal output of 500 megawatts (MW), and consist of two adjacent, identical and independent 250 MW plants, Unit #1 and Unit #2. Each Unit will also share common facilities. Each of the 250 MW units will have a dedicated SRSG/tower, heliostat array, and a dedicated steam turbine generator/ power block.

Each plant will include a start-up/auxiliary steam boiler that may be required during transient cloudy conditions in order to maintain the turbine on-line. After the clouds pass, production will resume from solar thermal input. After the solar thermal input resumes, the turbine will be returned to full solar production and the start-up/auxiliary boiler will be shut down.

2.2.1 Solar Plants

Each solar plant would use heliostats, which are elevated mirrors guided by a tracking system mounted on a pylon, to focus the sun's rays on a SRSG on top of a 750-foot tall solar power tower with a 10-foot tall lightening rod near the center of each solar field. The heliostat fields will focus solar energy on the SRSG on top of the power towers to produce steam. Each heliostat array will be comprised of four to eight sections with distinct focal lengths for the mirrors. In each plant, one Rankine-cycle non-reheat steam turbine would receive live steam from the SRSG, which would be located in the power block at the top of its own tower. The solar field and power generation equipment would start each morning after sunrise and would shut down (unless augmented by the auxiliary boilers) when insolation drops below the level required to keep the turbine online.

Each solar plant would include auxiliary steam boilers that may be required during transient cloudy conditions in order to maintain the turbine on-line. After the clouds pass, production would resume from solar thermal input. After the solar thermal input resumes, the turbine would be returned to full solar production and the auxiliary boilers would be shut down. The daily volume of energy generated by the plant may be extended using the auxiliary boilers. In addition to the boilers, each plant would use an air-cooled condenser or dry cooling to minimize water usage.

2.2.2 Common Area

A 15-acre common facilities area will be established on the southwestern corner of the site to accommodate an administration, warehouse, and maintenance complex; and an asphalt-paved visitor and employee parking area. The administration complex will be

served by power from the local 12.47 kV distribution system and by water from water supply wells located on the Modified Project site. The common facilities area will also be used for a temporary construction laydown area, as described below.

2.2.3 Access Roads and Drive Zones

Primary access to the site during both construction and operation will be by a new 1,350-foot, 24-foot wide paved road from Corn Springs Road. The access road will be constructed from a point just north of the I-10 Corn Springs Road entrance/exit ramps east to the Project site entrance, as described in the Final Decision. This road will include a 12-foot wide shoulder with gravel surface for truck staging to preclude traffic interferences.

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

In addition to the paved or hardscaped access road to the power block of each unit, 12-foot wide unpaved roads will radiate from the power block to provide access through the solar field to the internal perimeter access road. Within the heliostat fields, 10-foot wide "drive zones" will be located concentrically in the field to provide access to the heliostat mirrors for maintenance and cleaning (Figure 2.1-5). The drive zones will be located approximately 152 feet apart and will be grubbed to remove vegetation and smoothed. A 12-foot-wide unpaved path offset from the site fence by 5 feet will be constructed on the inside perimeter of the project boundary fence for use by PSEGS personnel to monitor and maintain perimeter security and tortoise exclusion fencing. These paths will be grubbed, bladed, and smoothed to facilitate safe use with minimal grading where necessary to cross washes.

2.2.4 Power Transmission

The bulk of the electric power produced by the facility will be transmitted to the grid. Some of the electric power will be used onsite to power auxiliaries such as the air-cooled condenser, 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. Emergency power will be provided by two diesel generator sets (one in each power block), each with 2,500 kW output capacity and one diesel generator set in the common area (with a 250 kW output capacity).

2.2.5 Natural Gas Fuel System

The Approved Project did not include a natural gas supply pipeline but rather was approved to use LPG for its auxiliary fuel. The Modified Project will use natural gas to fire its auxiliary and nighttime preservation boilers. The natural gas supply for PSEGS will be provided by SoCal Gas via a new distribution line that will be constructed from the Common Facilities Area south and under I-10 for a total of approximately 2,960 feet to connect to an existing SoCal Gas natural gas transmission line. Ultimately SoCal Gas will own and operate the new gas pipeline and has as part of its extensive gas supply system and has filed a SF 299 ROW Application with BLM. The PSEGS Project will install a gas metering station at the Project common area.

2.2.6 Electricity

Stand-by power and back-up power would be provided for all auxiliary components for which failures would cause an electrical or steam production shut down at the project site. The backup power components would be installed and kept in a ready status, in case of failure, and would be available for immediate service. One station service transformer would be required at each solar plant for backup power purposes.

2.2.7 Water Supply

The Final Decision allowed the Approved Project to use up to 1,917 acre feet per year (AFY) during construction (for a total of 5,750 acre feet during the 39 months) and 300 AFY during operation from up to 10 groundwater wells. The Modified Project will utilize the same number of groundwater wells but will only use up to 400AFY during construction (for a total of 1,130 acre feet during the construction period) and up to 201 AFY during operation. The wells will be used for process make-up water, mirror wash water, and domestic uses.

Each solar plant will have a raw water tank with a capacity of 800,000 gallons. A portion of the raw water (200,000 gallons) is for plant use while the majority will be reserved for fire water. The common area will also contain a combined service water/firewater tank with a capacity of 480,000 gallons.

PSEGS will generate electricity up to 16 hours a day, with the exception of a scheduled shutdown in winter 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.

2.2.8 Waste Management

Waste Water Collection, Treatment, and Disposal

The primary wastewater collection system would collect and process wastewater from all of the solar plant equipment, including the boilers and WSAC blowdowns. To the extent practical, process wastewater would be recycled and reused. Each solar plant onsite wastewater treatment (WWT) system consisting of either a thermal distillation system with mechanical vapor compression or RO with ion exchange. Distillate/permeate collected from the WWT plant would be recycled to the treated water storage tank for reuse within the plant. Concentrate from the WWT system would be disposed in evaporation ponds and allowed to evaporate. Each pond would be lined with a high-density polyethylene (HDPE) liner to prevent infiltration of process water into the soil below. When needed, pond sludge would be removed from the project site by an outside contractor.

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

Plant Drains and Oil/Water Separator

General plant drains would collect containment area washdown, sample drains, and drainage from facility equipment drains. Water from these areas would 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 would first be routed through an oil/water separator.

Raw Water Treatment System Waste

Reject waste produced from the reverse osmosis process in the raw water treatment system would be captured in the wastewater collection tank and treated in the wastewater treatment system.

Power Cycle Makeup Water Treatment Wastes

Demineralized water from the mixed-bed system would be used as the feed water from the power-cycle makeup treatment system. The mixed-bed unit would be a self-contained skid-mounted unit that would be regenerated offsite. There would be no liquid waste from the power cycle makeup water treatment equipment.

Boiler Blowdown

Boiler blowdown consists of water discharged from each SRSG to maintain the water chemistry within acceptable ranges. Boiler blowdown from the SRSG would be routed to the SRSG flash tank. Flash steam from the flash tank would be recovered back into the steam cycle via the deaerator. Condensate from the flash tank would be further flashed to the atmosphere, then cooled and recovered in the treated water storage tank. As an

alternative, blowdown may be discharged to the wastewater collection tank for treatment.

Blowdown from the nighttime preservation, start-up and auxiliary boilers would be collected in blowdown tanks and recovered in the treated water storage tank. As an alternative, blowdown may be discharged to the wastewater collection tank for treatment.

Solid Wastes

The PSEGS would 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 would be trucked offsite for recycling or disposal.

Hazardous Wastes

Several methods would be used to properly manage and dispose of hazardous wastes generated by the PSEGS. Waste lubricating oil would be recovered and recycled by a waste oil recycling contractor. Spent lubrication oil filters would be disposed in a Class I landfill. Workers would be trained to handle hazardous wastes generated at the project site.

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

2.2.9 Management of Hazardous Materials

A variety of chemicals would be stored and used onsite during construction and operation. The storage, handling, and use of all chemicals would 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 would be stored in appropriate chemical storage facilities. Bulk chemicals would be stored in tanks and most other chemicals will be stored in returnable delivery containers. Chemical storage and chemical feed areas would be designed to contain leaks, spills, and stormwater. Concrete containment pits and drain piping design would 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 would be provided adjacent to, or in the vicinity of, chemical storage and use areas. Plant personnel would use approved personal protective

equipment during chemical spill containment and cleanup activities. Personnel would 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 would be stored onsite for spill cleanup.

2.2.10 Emission Control and Monitoring

Air emissions from the combustion of natural gas in the auxiliary-boilers and start-up boilers at each plant would be controlled using appropriate air emission control devices. To ensure that the systems perform correctly, continuous emissions monitoring for oxides of nitrogen (NO_x) and carbon monoxide (CO) would be performed.

2.2.11 Fire Protection System

The fire protection system will be designed in accordance with applicable regulations, standards and codes to protect personnel and limit property loss and plant downtime in the event of a fire. The primary source of fire protection water will be the service/firewater storage tank located at each power block and the firewater storage tank in the common area. An electric jockey pump and electric-motor-driven main fire pump will be provided for each power block and the common area to maintain the water pressure in the fire main at the level required to serve all fire fighting systems. In addition, a back-up diesel-engine-driven fire pump will be provided for each power block and the common area to pressurize the fire loop if the power supply to the electric-motor-driven main fire pump fails.

The fire pumps will discharge to a dedicated underground firewater loop piping system. Normally, the jockey pumps 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 850 throughout the power block and common area. Generator step-up transformers and other oil-filled transformers will be contained and provided with a deluge system. Onsite personnel will be trained in the use of fire protection equipment and will be the first responders to an incident. A fire pump controller will be provided for each fire pump.

The Project is located such that it will fall under the jurisdiction of the Indio Office of the Riverside County Fire Department. Based on the requirements of Riverside County Ordinance No. 787.1, the piping system supplying the fire hydrants must be sized to convey a potential firewater flowrate of 5,000 gpm. Minimum firewater storage volume in each power block will be 600,000 gallons. Firewater will be supplied from the combined storage tank located at each power block. One electric primary and one diesel-fueled backup firewater pump, each with a capacity of 5,000 gpm, will deliver water to the fire protection piping network. Fire protection for the solar field is not required since no combustible materials will be present in the solar field area.

The common area fire protection system will be sized to comply with LORS, and will consist of one electric primary and one diesel-fueled backup firewater pump. Firewater will be supplied from the combined service water/firewater storage tank with a storage volume of 480,000 gallons.

The Hazardous Materials Risk Management Plan as required by the Conditions of Certification will include all information necessary to allow firefighting and other emergency response agencies to plan and implement safe responses to fires, spills, and other emergencies.

3.0 APPLICABLE STANDARDS

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 PSEGS:

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
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

LORS	Applicability
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
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.;	Provides fire protection requirements

LORS	Applicability
6170, et seq.; and 6175, et seq.	
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 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

LORS	Applicability
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 PSEGS:

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
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 56, Standards for Fire and Explosion Prevention During Cleaning and Purging of Flammable Gas Piping Systems.	Provides safety requirements for the cleaning and purging procedures of flammable gas piping systems for electric-generating plants.

LORS	Applicability
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 LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following local ordinances, regulations, and standards related to worker safety and fire protection services are applicable to the construction and ongoing operation of the PSEGS:

- *Riverside County Ordinance 457.* Adopts specific building, mechanical, plumbing, and electrical codes from sources such as the California Building Standards Commission with county-specific modifications.

- *Riverside County Ordinance 787.* Adopts the 2010 edition of the California Fire Code and portions of the 2010 edition of the California Building Code with county-specific modifications.

- *Riverside County Ordinance 615.* Establishes requirements for the use, generation, storage and disposal of hazardous materials within the County.

- *Riverside County Department of Environmental Health, Hazardous Materials Releases.* Adopts State requirements and guidelines to govern hazardous materials release response plans and inventories.

- *Chapter 22 of the 2010 California Fire Code.* This section of the California Fire Code addresses requirements for Motor Fuel-Dispensing Facilities and Repair Garages and has been adopted by Riverside County.

- *Riverside County Fire Department Strategic Plan 2009-2029.* The Riverside County Board of Supervisors read and filed the Riverside County Fire Department Strategic Plan in February 2010. The Strategic Plan contains the organizational mission, vision, and values; six goals; strategies for each goal; an implementation action plan; and supporting analysis of an organization and performance audit.

- *Riverside County Fire Protection and Emergency Medical Master Plan.* The Riverside County Fire Department (RCFD) adopted the Master Plan in 1987. The Master Plan serves as the general guiding document for the provision of fire protection and emergency medical services in the cities and unincorporated areas of the County protected by the RCFD. The Master Plan established response criteria based on Insurance Services Office (ISO) and NFPA standards for four different land use categories defined for the County. The four land use categories are Category I - Heavy Urban, Category II - Urban, Category III - Rural, and Category IV – Outlying. For each of these land use categories, the Master Plan defines goals and objectives related to: fire station location; suppression initiated; full assignment in operation; and initial attack fire control. There are minute values assigned to each land use designation. Although these values have been adopted, there have been internal adjustments based on new information, operational needs, and advances in technology.

3.4 OTHER STANDARDS

The following standards related to worker safety and fire protection services are applicable to the construction and ongoing operation of the PSEGS:

- *National Fire Protection Association No. 1006*. NFPA No. 1006 Standard for Technical Rescue Professional Qualifications, 2008 Edition, specifies the minimum job performance requirements for service rescuers in a technical rescue. This includes the application of special knowledge, skills, and equipment to safely resolve unique and/or complex rescue situations. This includes, but is not limited to, rope rescue, confined space rescue, trench rescue, structural collapse, and vehicle and machinery rescue. Since technical rescue is dangerous and technical rescuers are required to perform dangerous activities, technical rescuers shall complete all activities in the safest way possible and follow the applicable local, regional, and national safety standards.

- *National Fire Protection Association No. 1670*. NFPA No. 1670 Standard on Operations and Training for Technical Search and Rescue Incidents, 2009 Edition, specifies the level of functional capability for conducting operations at technical search and rescue incidents while minimizing risks to rescuers. This includes, but is not limited to, rope rescue, confined space rescue, trench rescue, structural collapse, and vehicle and machinery rescue.

4.0 FIRE PROTECTION SYSTEM

The fire protection system for the PSEGS 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 a service/firewater storage tank in each plant and a fire water storage tank in the common area.

An electric jockey pump and electric-motor-driven main fire pump will be provided to maintain the water pressure in each plant and the common fire main to the level required to serve all fire fighting systems. In addition, a back-up, diesel-engine-driven fire pump will be provided in each plant and the common area 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 pumps 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, Control, Warehouse, Maintenance Building, Heliostat Assembly Building, 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. 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 A for the *PSEGS Fire Protection Design Basis*.

5.0 SAFETY AND HEALTH PROGRAMS

5.1 CONSTRUCTION SAFETY AND HEALTH PROGRAMS

During the construction phase, the PSEGS would include the implementation of the Safety and Health Programs listed below. Prior to the start of construction, detailed programs and plans would be provided to the CEC, the RCFD, and other agencies as required by the Conditions of Certification. They are as follows:

- Injury and Illness Prevention Program for Project Construction
  - A written Code of Safe Practices that relates to construction activities.
  - Identification of the person or persons responsible for implementing the program.
  - Posting of the Code of Safe Practices at a conspicuous location at each job site office or providing it to each supervisor who shall have it readily available.
  - A system for identifying workplace hazards that includes inspections.
  - A system of verifying employee and subcontractor compliance.
  - "Toolbox" or "tailgate" meetings that supervisors conduct with employees to discuss job hazards and mitigation measures.
  - Methods of communicating with employees that encourage employees to expose unsafe activities.
  - Procedures for correcting unsafe conditions.
- Accident/incident reporting procedures
- Blood-Borne Pathogens Exposure Control Program
- Procedures for use of compressed gas and air-handling systems
- Confined-space entry procedures
- Contractor Safety Program
- Electrical safety procedures
- Emergency Action Plan/Emergency Response Plan
- Emergency response procedures
- Excavation, Trenching, and Shoring Program
- Fall Protection Program
- Fire Protection and Prevention Plan

- First-Aid/Cardiopulmonary Resuscitation/Automated External Defibrillator Program
- Hand tools and equipment guarding safety procedures
- Hazard Communication Plan (including Proposition 65 requirements)
- Hazardous materials handling procedures
- Hazardous waste awareness training
- Hearing Conservation Program
- Heat Stress Protection Plan
- Heavy equipment procedures
- Hoist/chain/wire rope/webs/rope slings/crane procedures
- Hot Work Program (welding, cutting, and brazing)
- Industrial Hygiene Program
- Industrial truck (forklift) safety
- Ladders, scaffolds, and work platforms
- Lockout/Tag-out Program including procedures to ensure potentially combustible materials are removed from the boilers prior to receiving solar flux
- Motor vehicle safety
- Personal Protective Equipment Program
- Portable electric and pneumatic tools
- Preventing slips, trips, and falls
- Repetitive stress injuries/ergonomics/lifting hazards
- Respiratory Protection Program
- Safety and Housekeeping Inspection Program
- Safety Committee and toolbox tailgate safety meetings
- Security Program
- Signs, tags, and barricades
- Tools (power- and hand-operated)
- UXO Identification, Training and Reporting Plan

5.2 OPERATIONS SAFETY AND HEALTH PROGRAMS

After the completion of the construction phase and the commencement of the operation of the PSEGS, the construction Safety and Health Programs would transition into an operation-oriented program reflecting the hazards and controls necessary. Detailed programs and plans would be submitted to the CEC, the RCFD, and other agencies as required by the Conditions of Certification. They are as follows:

- Injury and Illness Prevention Program for Project Operation
  - A list of the person(s) with authority and responsibility for implementing the program.
  - A system for verifying that employees comply with safe and healthful work practices.
  - A system for communicating with employees in a readily understandable form.
  - Procedures for identifying and evaluating workplace hazards, including inspections, to identify hazards and unsafe conditions.
  - Methods for correcting unhealthy/unsafe conditions in a timely manner—when the hazard is discovered and/or when there is an imminent danger.
  - A training program for:
    establishing the program initially;
    new, transferred, or promoted employees;
    new processes and equipment; and
    supervisors.
  - Methods of documenting inspections and training and maintaining records for three years.
- Accident/incident reporting procedures
- Blood-Borne Pathogens Exposure Control Program
- Best Management Practices (BMPs) for herbicide storage and application
- Chemical Hygiene Plan
- Code of Safe Practices for Equipment and Operation
- Procedures for use of compressed gas and air-handling systems
- Confined-space entry procedures
- Electrical safety procedures
- Emergency Action Plan
- Emergency response procedures
- Fall Protection Program

- Fire Protection and Prevention Plan
- First-Aid/Cardiopulmonary Resuscitation/Automated External Defibrillator Program
- Hand tools and equipment guarding safety procedures
- Hazard Communication Plan (including Proposition 65 requirements)
- Hazardous materials handling procedures
- Hazardous waste awareness training
- Hearing Conservation Program
- Heat Stress Protection Plan
- Heavy equipment procedures
- Hoist/chain/wire rope/webs/rope slings/crane procedures
- Hot Work Program (welding, cutting, and brazing)
- Industrial Hygiene Program
- Industrial truck (forklift) safety
- Ladders, scaffolds, and work platforms
- Lockout/Tag-out Program
- Motor vehicle safety
- PPE Program
- Portable electric and pneumatic tools
- Preventing slips, trips, and falls
- Repetitive stress injuries/ergonomics/lifting hazards
- Respiratory Protection Program
- Safety and Housekeeping Inspection Program
- Safety Committee and toolbox tailgate safety meetings
- Security Program
- Stop work authority
- Signs, tags, and barricades
- Tools (power- and hand-operated)

5.3 TRAINING PROGRAMS

5.3.1 Construction Training Program

Training will be delivered to the construction 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. As a minimum, employees and workers will receive a full Safety Orientation which includes (among other topics), PPE, fall protection, and welding safety, which is conducted by the EPC contractor that is required of all and Worker Environmental Awareness Program (WEAP) training that will be provided by a qualified individual.

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.

- New employees will receive safety training orientation.
- Weekly safety meetings will be held with employees.
- Toolbox/tailgate safety meetings will be conducted periodically for each crew. General safety topics and specific hazards that may be encountered will be discussed. Comments and suggestions from all employees will be encouraged.
- Regularly scheduled safety meetings will be held for supervisors.
- Hazard communication training, including California Proposition 65 warnings and discharge prohibitions, will be conducted as new hazardous materials are introduced into the workplace.
- Material Safety Data Sheets (MSDSs) will be provided for all appropriate chemicals. A bulletin board with required postings and other information will be maintained at the plant site.
- Warning signs will be posted in hazardous areas.

Safety training will be provided to each new employee as indicated below.

- Safe work rules for the PSEGS will be explained to each new employee.
- A copy of the applicable Safe Work Practices will be given to each new employee. The provisions will be incorporated into training for the qualifications programs so that employees may fully understand what the protective provisions mean.

- The Hazard Communication Program and other applicable training and requirements for personal protection of the types of hazards that may be encountered at the project will be explained to employees. This training will be documented.
- Unusual hazards that are found on site will be explained in detail to each new employee, including any specific requirements for personal protection.
- Safety requirements for the new employee's specific job assignment will be explained by the foreman upon initial assignment and upon any reassignment.

6.0 HAZARDS OF THE PROJECT

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

6.1 USES AND STORAGE OF HAZARDOUS MATERIALS

The primary difference between the Approved Project and the PSEGS is the elimination of millions of gallons of Therminol flammable oil from the solar field. The PSEGS would use and store hazardous materials during construction activities and ongoing operation. Tables 6-1 and 6-2 provide below a list of the hazardous materials to be used at the PSEGS project site and their use and storage location. Table 6-3 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 PSEGS.

6.1.1 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 PSEGS project site.

No regulated substances would be used during construction activities for the PSEGS. 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 PSEGS 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

TABLE 6-2
PSEGS CHEMICAL INVENTORY AT THE PSEGS 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)
PSEGS CHEMICAL INVENTORY AT THE PSEGS 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

[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 PSEGS 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 PSEGS due to hazardous materials is discussed below.

6.1.2 Operation Phase

The operation of the PSEGS 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 PSEGS based on the Title 22 CCR characteristics criteria and based on the properties of the substances themselves. The hazardous materials used at the project site are not considered "Regulated Substances" subject to the requirements of the California Accidental Release Program (CalARP Program) and process safety management.

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 PSEGS 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 storage and use of products such as Ammonia 19% Aqueous will be in single totes to limit the exposer of damage and spills to a single item during operation.

The potential for hazards related to accidental releases, fires, or explosions to occur during ongoing operation of the PSEGS 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 PSEGS 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 line. Since the gas line would be newly constructed to meet the current standards of pipeline design and construction, based on NFPA 54 the potential for leakage would be less than that of an older pipeline. The ongoing maintenance will follow NFPA 56, which provides safety requirements for the cleaning and purging procedures of flammable gas piping systems for electric-generating plants. 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 PSEGS, 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 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 PSEGS 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.

Based on the potential hazards identified in the PSEGS 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 probability of a risk as a result of the construction activities and operation of the PSEGS that would require a response by fire protection and emergency medical service personnel have been summarized in Table 6-5.

Mishap severity categories are defined to provide a qualitative measure of the most reasonable credible mishap resulting from personnel error, environmental conditions, design inadequacies, procedural deficiencies, or system, subsystem, or component failure or malfunction. Suggested mishap severity categories are shown in Table 6-3. The dollar values shown in this table should be established on a system by system basis depending on the size of the system being considered to reflect the level of concern.

Severity Categories

Table 6-3

SEVERITY CATEGORIES		
Description	**Severity Category**	**Mishap Result Criteria**
Catastrophic	**1**	Could result in one or more of the following: death, permanent total disability, irreversible significant environmental impact, or monetary loss equal to or exceeding $10M.
Critical	**2**	Could result in one or more of the following: permanent partial disability, injuries or occupational illness that may result in hospitalization of at least three personnel, reversible significant environmental impact, or monetary loss equal to or exceeding $1M but less than $10M.
Marginal	**3**	Could result in one or more of the following: injury or occupational illness resulting in one or more lost work day(s), reversible moderate environmental impact, or monetary loss equal to or exceeding $100K but less than $1M.
Negligible	**4**	Could result in one or more of the following: injury or occupational illness not resulting in a lost work day, minimal environmental impact, or monetary loss less than $100K.

Mishap probability is the probability that a mishap will occur during the planned life expectancy of the system. It can be described in terms of potential occurrences per unit of time, events, population, items, or activity. Assigning a quantitative mishap probability to a potential design or procedural hazard is generally not possible early in the design process. At that stage, a qualitative mishap probability may be derived from research, analysis, and evaluation of historical safety data from similar systems. Supporting rationale for assigning a mishap probability is documented in hazard analysis reports. Suggested qualitative mishap probability levels are shown in Table 6-4.

Mishap Table

Table 6-4

Description	Level	Specific Individual Item	Fleet or Inventory
Frequent	**A**	Likely to occur often in the life of an item.	Continuously experienced.
Probable	**B**	Will occur several times in the life of an item.	Will occur frequently.
Occasional	**C**	Likely to occur sometime in the life of an item.	Will occur several times.
Remote	**D**	Unlikely, but possible to occur in the life of an item.	Unlikely, but can reasonably be expected to occur.
Improbable	**E**	So unlikely, it can be assumed occurrence may not be experienced in the life of an item.	Unlikely to occur, but possible.
Eliminated	**F**	Incapable of occurrence. This level is used when potential hazards are identified and later eliminated.	Incapable of occurrence. This level is used when potential hazards are identified and later eliminated.

Risk Probability at PSEGS

Table 6-5

Hazard	Probability of Risk
Use and storage of hazardous materials during construction	Remote
Use and storage of hazardous materials during operation and maintenance	Remote
Accidental release of hazardous materials	Improbable
Fire or explosion from hazardous materials	Remote
Fire or explosion from use of natural gas, diesel fuel, transformer oil and lubrication oil	Remote
Worker safety during typical construction, operation, and maintenance	Remote
Worker safety related to height of tower during construction, operation, and maintenance	Improbable
Worker safety related to work in confined spaces during construction, operation, and maintenance	Improbable
Worker safety related to height of tower during construction, operation and maintenance	Improbable
Offsite vehicle accidents	Remote

Based on Cal-OSHA 2011 data, NFIRS data and CSFM 2011 data

The ultimate goal of the system safety program at PSEGS is to design systems that contain no hazards. However, since the nature of most complex systems makes it impossible or impractical to design them completely hazard-free, a successful system safety program often provides a system design where there exist no hazards resulting in an unacceptable level of mishap risk. As hazard analyses are performed, hazards will be identified that will require resolution. The system safety design order of precedence defines the order to be followed for satisfying system safety requirements and reducing risks.

7.0 EXISTING RESOURCES

7.1 FIRE DEPARTMENT RESOURCES

7.1.1 Department Overview

The Riverside County Fire Department (RCFD) is one of the largest regional fire service organizations in California. According to the *Riverside County Fire Department Strategic Plan 2009-2029*, the County supplements its fire staff of 175 by contracting with the State of California Department of Forestry and Fire Protection (CAL FIRE) for an additional 1,050 employees to provide fire protections services. Through their partnership with CAL FIRE, the RCFD serves 22 partner agencies. They serve an area of 7,200 square miles with approximately 1.3 million residents.

The RCFD responds to both urban and wildfire emergencies. According to the *Riverside County Fire Department/CAL FIRE 2012 Yearly Emergency Incident Statistics* report, in 2012, the RCFD responded to 130,620 total incidents.

The RCFD operates 92 fire stations in six divisions. These divisions are comprised of 17 line battalions providing fire suppression, emergency medical, technical rescue, fire prevention, and related services. The PSEGS project site is located within the East Desert Division which encompasses the lower Coachella Valley and extends east out to the Arizona State line.

7.1.2 Stations Serving the Project Site

Table 7-1 provides the fire stations that are the closest to the PSEGS project site and their respective distances and response times to the site. These stations are staffed full-time, 24 hours seven days per week, with a minimum three person crew including Paramedics operating a "Type-1" structural fire fighting apparatus.

Table 7-2 provides the annual emergency incident statistics for the year 2012 for the three RCFD stations closest to the PSEGS site. As indicated in Table 7-2, these three stations responded to a total of 665 calls in the year 2012; none of which were to a fire at a commercial land use. In addition, these three fire stations responded to a total of 323 emergency medical calls and 155 traffic collisions (typically requiring emergency medical aid) in the year 2012 and, therefore, 71 percent of the total calls received by the three stations were for emergency medical aid and not fire-related.

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

Station No.	Station Address	Distance From Project Site (Miles)	Est. Response Time (Minutes After Dispatch)
RCFD Station No. 49 (Lake Tamarisk)	43880 Lake Tamarisk, Desert Center, CA 92239	10.9	15
RCFD Station No. 43 (Blythe)	140 West Barnard Street, Blythe, CA 92225	32	30
RCFD Station No. 45 (Blythe Air Base)	17280 W. Hobson Way, Blythe, CA 92225	39	40

Source: Riverside County Fire Department GIS Manager March 19, 2011.

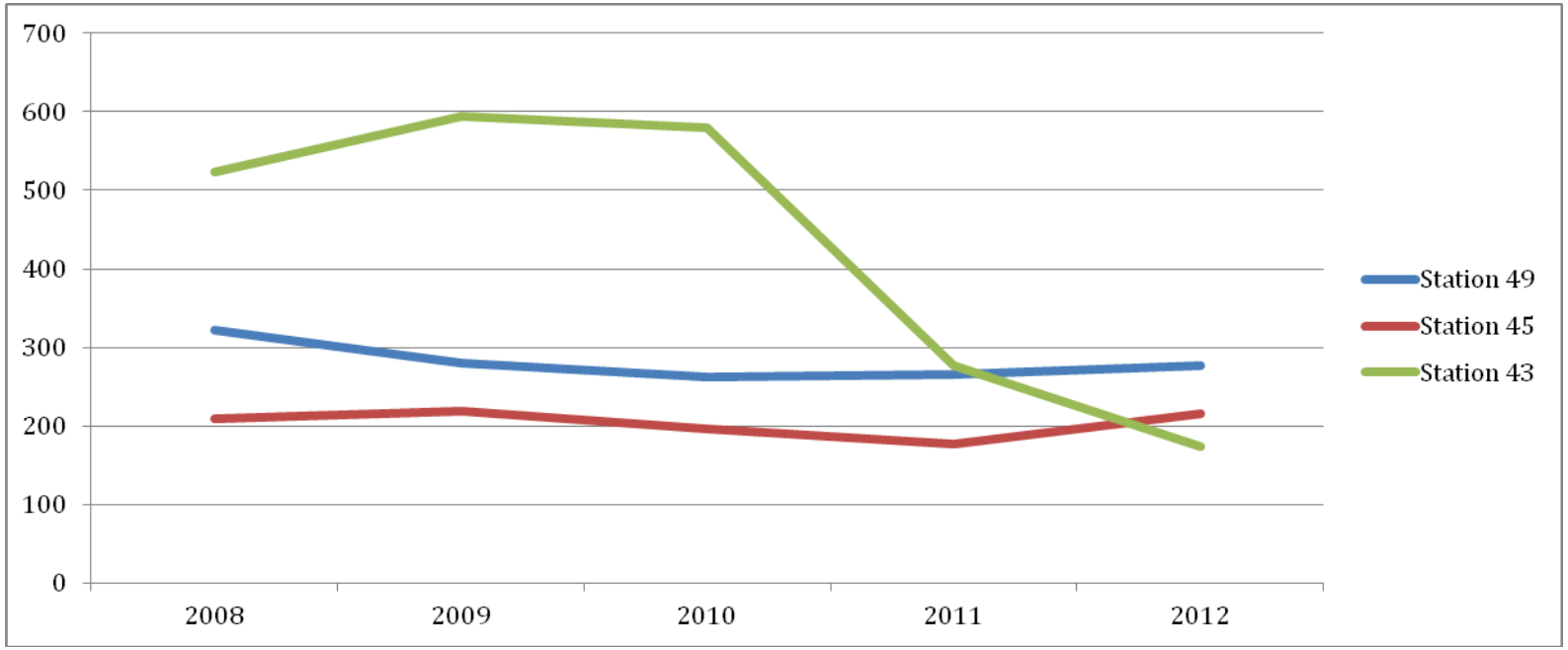
TABLE 7-2
CLOSEST FIRE STATIONS TO THE PSEGS PROJECT SITE
ANNUAL EMERGENCY INCIDENT STATISTICS FOR 2012

Station No.	Commercial Fire	False Alarm	Hazardous Material	Medical	Multi-Family Dwelling Fire	Other Fire	Other Miscellaneous	Public Service Assistance	Residential Fire	Rescue	Standby	Traffic Collision	Vehicle Fire	Wildland Fire	TOTAL
RCFD Station No. 49 (Lake Tamarisk)	0	17	0	112	0	2	3	2	2	1	5	114	10	1	276
RCFD Station No. 45 (Blythe Air Base)	0	11	1	123	0	10	14	16	3	0	2	30	4	2	216
RCFD Station No. 43 (Blythe)	0	14	0	88	0	23	12	2	0	1	10	11	2	10	173
TOTAL	**0**	**42**	**1**	**323**	**0**	**35**	**29**	**20**	**5**	**2**	**17**	**155**	**16**	**13**	**665**

Source: Riverside County Fire Department/CAL FIRE 2012 Yearly Emergency Incident.

Table 7-3

Calls for service history of the 3 Stations serving PSEGS



Source: Riverside County Fire Department/CAL FIRE 2008-12 Yearly Emergency Incident Reports.

Based on a "reasonable standard" for an engine company workload of 6.5 calls per day (or 2,190 calls on an annual basis) as defined in the *Riverside County Fire Department Strategic Plan 2009-2029*, the 3 fire stations closest to the PSPGS site have the capability of responding to a total of 6,570 calls per year. The total of 665 annual calls between the 3 stations in year 2012 represents 10% of the maximum workload capacity for these 3 stations. Additionally, the total number of calls between the 3 stations in year 2012 was down 75 calls from year 2011, or a reduction in calls of 9%. Further, during years 2011 and 2012, the Genesis Solar Energy Project, the Desert Sunlight Project, and the SCE Red Bluff Substation were all under construction, and therefore it does not appear that the cumulative construction of these projects resulted in any additional drawdown of RCFD resources at these 3 stations.

Thus, based on workload capacity alone, the addition of the PSEGS facility to their service area would not justify the addition of an engine company, a fire station, or any additional staff.

7.1.3 Fire Protection and Emergency Medical Master Plan

The RCFD adopted the *Riverside County Fire Protection and Emergency Medical Master Plan* (Master Plan) in 1987. The Master Plan serves as the general guiding document for the provision of fire protection and emergency medical services in the cities and unincorporated areas of the County protected by the RCFD. The Master Plan established response criteria based on Insurance Services Office (ISO) and NFPA standards for four different land use categories defined for the County. The four land use categories are Category I - Heavy Urban, Category II - Urban, Category III - Rural, and Category IV – Outlying. For each of these land use categories, the Master Plan defines goals and objectives related to: fire station location; suppression initiated; full assignment in operation; and initial attack fire control. There are minute values assigned to each land use designation. Although these values have been adopted, there have been internal adjustments based on new information, operational needs, and advances in technology.

The PSEGS site falls within land use category "Category IV – Outlying" in the Master Plan. The Master Plan provides the objective to "Apply extinguishing agent to structure and vegetation fires within 20 minutes of dispatch, full assignment within 30 minutes (Fire Station located within 8 miles)" and "Initiate suppression within 15 minutes of receipt of alarm for 90% of all fires." Furthermore, the Master Plan provides the objective to "Control 80% of all outlying fires with initial attack assignment." The intent of these objectives is to address the portions of Riverside County that are remotely located away from urban development and do not generate the same level of demand for fire protection services as an area of the County with more intensified development. As indicated in the Master Plan, the provision of "an equitable level [of service] is not necessarily an identical level of service." PSEGS is within the Category IV- Outlying response criteria and while not within 8 miles of Station 49 would meet the response requirements and would not need additional stations and equipment to meet the service level for Category IV.

In addition, the Master Plan provides the standard that one new fire station and/or engine company is recommended for every 3.5 million square feet of industrial building area. Based on this, the PSEGS would not require a new fire station.

7.1.4 Riverside County Fire Severity Map

The PSEGS site is within a "Non-High Fire Hazard Severity Zone" according to the *Approved Very High Fire Hazard Severity Zones and Local Responsibility Areas* map, dated December 24, 2009, prepared by CAL FIRE and adopted by the County of Riverside.

7.2 EMERGENCY MEDICAL SERVICES RESOURCES

Riverside County Fire Emergency Medical Services (EMS) Bureau is part of the Special Operation Division and is responsible for ensuring that the emergency medical services provided by the RCFD meets and exceeds the standard of care and the applicable laws and protocols. The primary objective of the Bureau is to "promote the highest quality of patient care by providing EMS personnel the support and resources necessary for optimal field performance. The duties of EMS include: provide medical quality control and improvement; provide EMS continuing education and training; address equipment supply and maintenance; serve as a liaison to County EMS and the health agencies; and provide community awareness and education.

Emergency Medical Services to the PSEGS project site are provided by the three RCFD stations discussed above. Refer to Table 7-1 for the estimated response time from the three stations closest to the project site. As discussed above, the staffing at each of these stations includes a Paramedic. When responding to a call, a Paramedic would provide advanced life support until the injured or ill person can be transported to the hospital.

Since the Paramedic is part of the minimum four person crew at Station 49 and the other three person crews at stations 43 and 45 that serve the project area, the workload capacity discussion provided above would be applicable to the provision of emergency medical services.

8.0 FIRE PROTECTION AND EMERGENCY MEDICAL SERVICES IMPACT ANALYSIS

8.1 PROJECT EFFECTS

The construction and operation of the PSEGS would result in the addition of two solar thermal power plants within the service area for the RCFD. Refer to Section 3.0 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 facility.

The area around the project site is comprised of open space and agricultural land. The PSEGS project site and the adjacent area is within a "Non-High Fire Hazard Severity Zone" according to the *Approved Very High Fire Hazard Severity Zones and Local Responsibility Areas* map, dated December 24, 2009, prepared by CAL FIRE and adopted by the County of Riverside.

As discussed in Section 4.0 of this document, extensive fire protection systems are incorporated into the design of the PSEGS. The fire protection systems would be designed and maintained in accordance with the relevant NFPA guidelines and local code requirements as described in the Palen Solar Electrical Generating System Fire Protection Plan provided as Appendix A 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 PSEGS. 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.

8.1.1 Fire Protection

As discussed in Section 6.0 of this document, based on the potential hazards identified in the PSEGS 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 probability of risks as a result of the construction activities and operation of the PSEGS that would require fire protection and emergency medical services would be extremely low. Therefore, the potential increase in the demand for fire protection services would be considered less than significant. Refer to Section 6.0 of this document for the list of the potential hazards addressed.

The PSEGS project site is located within RCFD Battalion 8. Table 7-1 in Section 7.0 of this document, provides information regarding the distance and response times for the RCFD stations closest to the project site. These stations are staffed full-time, 24 hours

seven days per week, with a minimum four person crew including Paramedics operating a "Type-1" structural fire fighting apparatus from the closest station and a three person staffing from the other surrounding stations.

Table 7-2 in Section 7.0 of this document provides the annual emergency incident statistics for the year 2012 for the three RCFD stations closest to the PSEGS project site. As indicated in Table 7-2, these three stations responded to a total of 665 calls in the year 2012; none of which were to a fire at a commercial land use. In addition, these three fire stations responded to a total of 665 emergency medical calls and 155 traffic collisions (typically requiring emergency medical aid) in the year 2012 and, therefore, 71 percent of the total calls received by the three stations were for emergency medical aid and not fire-related. Based on a "reasonable standard" for an engine company workload of 6.5 calls per day (or 2,190 calls on an annual basis) as defined in the *Riverside County Fire Department Strategic Plan 2009-2029*, the three fire stations closest to the PSEGS site have the capability of responding to a total of 6,570 calls per year. The total of 665 annual calls in the year 2012 represents 10 percent of the maximum workload capacity for these three fire stations. In addition, the Ivanpah Solar Energy System under construction in San Bernardino County has resulted in five calls since construction commenced in October 2010 and its construction activities and workforce are very similar to that of the PSEGS. Since the PSEGS would have a very limited need for fire protection services and the existing workload is well below the estimated maximum capacity for the three responding stations, the PSEGS would not interfere with the ability of Station No. 49 (Lake Tamarisk), Station No. 45 (Blythe Air Base), and Station No. 43 (Blythe) to respond to other calls unrelated to the PSEGS that occur in their service area. Therefore, based on existing workload capacity, the addition of the PSEGS to the RCFD service area would not justify the addition of an engine company, a fire station, or any additional staff.

8.1.2 Technical Rescue

The probability of risks as a result of the construction activities and operation of the PSEGS 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 on the RCFD for high angle rescue, low angle rescue, and confined space rescue on the PSEGS 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, it is important to note that the Blythe Energy Project Natural Gas Power Plant Commission License resulted in the staffing, equipping and fully training of the Blythe Fire Department to respond to technical rescue incidents at a natural gas power plant facility. If an incident were to occur at the PSEGS, through the mutual aid system with Riverside County the Blythe Fire Department would also be able to assist RCFD in responding to the need for technical rescue support.

8.1.3 Emergency Medical Services

The probability of risks as a result of the construction activities and operation of the PSEGS that would generate a demand for responses to a emergency medical incident, would be extremely low. The demand for emergency medical services by the PSEGS during construction would be would be eliminated through the use of an onsite Nurse (provided by the Applicant). The onsite Nurse would assess any incident and triage affected personnel to determine if secondary response personnel are needed. This system has worked extremely well for the construction of the Ivanpah Solar Electricity Generation System project in San Bernardino County. If required, the Nurse shall direct other personnel to contact the RCFD via 911. With the request being made per Riverside County EMS policies, a ground or air ambulance would be dispatched. If ground transportation is used, the injured/ill employee would be transported to the local hospital or to another offsite emergency medical facility. 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. Therefore, the addition of the PSEGS to the RCFD service area would not require additional emergency medical responses from the RCFD.

8.1.4 Fire Protection and Emergency Medical Services Master Plan

The PSEGS project site falls within land use category "Category IV – Outlying" in the Riverside County Fire Protection and Emergency Medical Master Plan (Master Plan). The Master Plan provides the objectives to "Apply extinguishing agent to structure and vegetation fires within 20 minutes of dispatch, full assignment within 30 minutes (Fire Station located within 8 miles)" and "Initiate suppression within 15 minutes of receipt of alarm for 90% of all fires." Furthermore, the Master Plan provides the objective to "Control 80% of all outlying fires with initial attack assignment." However, to qualify these objectives in order to address the portions of Riverside County that are remotely located away from urban development and do not generate the same level of demand for fire protection services as an area of the County with more intensified development, the Master Plan states that "In a Jurisdiction as large and complex as that served by the RCFD, it is not practical to meet these response time/distance requirements for all land use categories. Therefore, the corresponding goals and objectives represent a compromise between "ideal" requirements and community needs and the availability of resources."

As discussed above, with the design of the fire protection PSEGS systems and implementation of the Safety and Health Programs and the consultant recommendations during construction and the ongoing operation of the proposed project, there would be a very limited need for fire protection services from the RCFD. While the PSEGS project site is more than 8 miles from Station 44, it falls within the Master Plan objectives for "Category IV – Outlying." Therefore, no impact related to the Master Plan would occur.

8.2 CUMULATIVE EFFECTS

As indicated in the Master Plan, the provision of "an equitable level [of service] is not necessarily an identical level of service." This logic can be applied to the determination of the PSEGS potential contribution to the cumulative effect on fire protection services provided by the RCFD. As demonstrated in the analysis provided in this document, the design of the PSEGS fire protection systems and the implementation of the Safety and Health Programs and the consultant recommendations during construction and the ongoing operation of the proposed project, would result in a very limited need for fire protection services and eliminate the need for emergency medical services.

Therefore, the construction and operation of the PSEGS would not contribute to a significant cumulative impact to fire protection and emergency medical services provided by the RCFD.

It is recognized that the facility will require, and the project Owner has agreed to participate, in the mitigation programs of the County of Riverside County Fire Department. Because power generating facilities are not the typical risk scenario in buildings with the usual zone modeling items such as egress, smoke generation, fire spread based on commodities, effects of detection and suppression system. NFPA 551 also recognizes this in their fire scenario assumptions where there is not sufficient date to support modeling a facility. According to the State Fire Marshal's Incident Reporting system in California there is an average of 2 fire incidents per year in all of CEC permitted facilities. Again, while this is not sufficient data to model a facility based on historic fire occurrences, it is evidence that the CEC's Conditions of Certification are effective in reducing the need for local jurisdictions to respond to incidents at CEC-licensed facilities.

In California from reports published by Cal/OSHA in 2011 there were 5 fatalities associated with electrical power generation, transmission, and distribution, 4 where from transportation incidents. It is not known if the other fatality was from the operation and construction of power plants. Because there have been extremely low numbers of injuries and fatalities in power plant operation, Cal/OSHA and OHSH have not given this industry a separate code to distinguish power plant operation from other electric utility operations. During utility system construction there were 3 facilities and (for the same reason as operation) it is unknown if any were in the construction of power generating facilities.

With the development of other solar power generation facilities PSEGS will be required to participate in a mitigation plan for the fire department. While the incident rate in power facilities are low there are the possibilities especially during construction of technical rescue incidents that would require the fire department to have that specialized equipment available and the staff trained for the facilities in the area. But it must be understood fire department recourses will not only serve the solar industry but will primarily be used for incidents involving the general population and visitors to Riverside County such as

vehicle accident incidents. In other words, the Applicant's participation in mitigation will provide a net benefit to Riverside County because equipment and Staff provided will not only be used at the PSEGS facility but will be able to be used for the vast majority of non-PSEGS related incidents.

9.0 RECOMMENDATIONS

The consultant team for the preparation of this document provides the following recommended requirements to be incorporated into the design of the PSEGS and the construction and ongoing operation of the facility:

- During construction activities 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, the daily on-site operational and maintenance personnel for the Central Receiver Tower shall be required to have training based on federal and state standards and equipment manufacturer's requirements.

- During operation, the contractor to perform the annual maintenance for the Central Receiver 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 including the use of lock out/tag out procedures to ensure flammable materials are removed from the boilers prior to generation of solar flux.

- During construction the applicant fund the cost of a medium rescue vehicle and equipment. The estimated cost of a medium rescue unit fully equipped is $1.2 million.

- During construction the applicant would fund one Fire Captain and half the cost of a firefighter to staff the medium rescue unit and during operation the applicant will pay one sixth of the on going operations cost. Currently there are four CEC projects under construction or consideration, and two Riverside County approved project. The Genesis Project is currently paying for one additional position at Station 49, that fire fighter would be moved to the rescue unit for the power projects. Staffing at Station 49 would return to normal RCFD staffing and would be augmented by the rescue unit. Staffing cost of 1 fire captain @ $167.000 X 3 positions = $501,000 and 1/2 firefighter @ $61,000 X 3 positions= $183,000 for total staffing cost of the first 3 years of $684,000 per year and one sixth the total cost @$114,000 each year after.[1]

[1] *Costs where provided by Riverside County Fire Department Administration Chief, Deputy Chief Patterson June 2013.*

- The plant operator will assist the fire department staff with training specific to the PSEGS's systems.

- During construction and operation the applicant will pay any inspection fees per county ordinance required for plan approval, and inspections.

Appendix A

PALEN SOLAR ELECTRIC GENERATING SYSTEM

FIRE PROTECTION DESIGN BASIS

Palen Solar Electric Generating System (PSEGS)

Fire Protection Design Basis

The PSEGS 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 Chief Building Official (CBO). 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-10. 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
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PALEN SOLAR ELECTRIC GENERATING SYSTEM AMENDMENT

Docket No. 09-AFC-07C
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(Revised 07/09/2013)

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Eileen Allen
Commissioners' Technical
Adviser for Facility Siting

DECLARATION OF SERVICE

I, Marie Fleming declare that on July 23, 2013, I served and filed copies of the attached PALEN SOLAR HOLDINGS, LLC'S FIRE AND EMERGENCY SERVICES RISK ASSESSMENT, dated July 23, 2013. This document is accompanied by the most recent Proof of Service, which I copied from the web page for this project at: http://www.energy.ca.gov/sitingcases/palen/compliance/.

The document has been sent to the other persons on the Service List above in the following manner:

(*Check one*)

For service to all other parties and filing with the Docket Unit at the Energy Commission:

_X_ I e-mailed the document to all e-mail addresses on the Service List above and personally delivered it or deposited it in the U.S. mail with first class postage to those parties noted above as "hard copy required";

OR

____ Instead of e-mailing the document, I personally delivered it or deposited it in the U.S. mail with first class postage to all of the persons on the Service List for whom a mailing address is given.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, and that I am over the age of 18 years.

Dated: July 23, 2013

Marie Fleming