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Alamitos Energy Center

(13-AFC-01)

Applicant's Opening Testimony

Submitted to

California Energy Commission

Prepared by

AES Alamitos Energy, LLC

October 18, 2016

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Introduction

Attached is AES Alamitos Energy, LLC's (AES or the Applicant) testimony, including preliminary identification of contested issues, in support of the Alamitos Energy Center (AEC) (13-AFC-01) evidentiary hearings. In addition, the Applicant's testimony also constitutes the Applicant's comments on the California Energy Commission's (CEC) Final Staff Assessment (FSA) (Transaction Number [TN] #213768 and 213943). Declarations and resumes for each witness are also provided, following the testimony.

Project Description

I. Introduction

A. Names: Stephen O'Kane and Jerry Salamy

B. Qualifications: The panel's qualifications are as noted in their resumes contained in Appendix A.

C. Prior Filings: In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- AES Southland Development, LLC, Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #201620-1 through #201620-72), December 27, 2013.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Data Adequacy Supplement (TN #201751), February 17, 2014.
- CH2M HILL, Alamitos Energy Center (13-AFC-01) Staff Query 1 – Transmission and Project Description (TN #202163), April 21, 2014.
- CH2M HILL, Alamitos Energy Center (13-AFC-01) Data Response Set 1A – Responses to CEC Staff Data Requests 1-8, 10-12, 16-17, 20-25, 38-44, 51-54, and 59-62 (TN #202381), May 27, 2014.
- AES Alamitos Energy, LLC, Supplemental Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #206427-1 through 206427-6 and 206428-1 through 206428-3), October 23, 2015.
- Memorandum of Understanding between AES Alamitos, LLC and City of Long Beach (TN #206920), November 16, 2015.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Data Responses, Set 6 (Response to Data Requests 83 to 168) (TN #207013), December 14, 2015.
- AES Alamitos Energy, LLC, Alamitos Energy Center (13-AFC-01): Removal of Temporary Secondary Construction Access Road (TN #210632), March 7, 2016.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Preliminary Staff Assessment Summary of PSA Workshop and Supplemental Comments (TN # 212771), August 12, 2016.
- AES Alamitos Energy, LLC, Alamitos Energy Center (13-AFC-01): Response to Plains West Coast Terminals LLC's Comments (TN #213734), September 19, 2016.

All of the facts contained in this testimony (including all referenced documents) are true and correct, to the best of our knowledge. To the extent this testimony contains opinions, such opinions reflect our best professional judgement. We make these statements, and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

II. Summary of Testimony

The AEC, a nominal 1,040-megawatt (MW), natural-gas-fired, combined-cycle and simple-cycle, air-cooled electrical generating facility, will be constructed on an approximately 21-acre site within the larger 71.1-acre property of the existing Alamitos Generating Station (AGS). This site is located in an industrial-zoned area within Long Beach, California. Access to the AEC site will be provided via an existing entrance off North Studebaker Road, just north of the intersection of Westminster Avenue and North Studebaker Road.

Land use in the vicinity of the AEC site is a mix of industrial, commercial, residential, and recreational development. The AGS parcel is bounded to the north by the Southern California Edison (SCE) switchyard and State Route (SR) 22 (East 7th Street); to the east by the San Gabriel River and, beyond that, the Los Angeles Department of Water and Power (LADWP) Haynes Generating Station; to the south by the former Plains West Coast Terminals petroleum storage facility and undeveloped property; and to the west by the Los Cerritos channel, AGS cooling-water canals, and the residences west of the channel.

The AEC will consist of two gas turbine power blocks. Power Block 1 will consist of two natural-gas-fired combustion turbine generators (CTG) in a combined-cycle configuration with two unfired heat recovery steam generators (HRSG), one steam turbine generator (STG), an air-cooled condenser, an auxiliary boiler, and related ancillary equipment (collectively, AEC CCGT). Power Block 2 will consist of four simple-cycle CTGs with fin-fan coolers and ancillary facilities (collectively, AEC SCGT). The AEC CCGT and AEC SCGT are unique assets that will provide, among other benefits, greater reliability to meet Resource Adequacy needs for the southern California electrical system.

To provide fast starting and stopping, flexible generating resources, the AEC CCGT will be configured and deployed as a multistage generating (MSG) facility. The MSG configuration will allow the AEC units to generate power across a wide and flexible operating range while maintaining a relatively constant and efficient heat rate. The AEC CCGT can serve both peak and intermediate loads with the added capabilities of rapid startup, significant turndown capability (ability to turn down to a low load), and fast ramp rates (10 percent per minute for the AEC CCGT when operating above minimum gas turbine turndown capacity). As California's intermittent renewable energy portfolio continues to grow, operating flexible generating resources in either load following or partial shutdown mode is necessary to maintain electrical grid reliability, placing an increased importance upon the rapid startup, low turndown, steep ramp rate, and superior heat rate of the MSG configuration employed at the AEC.

By using proven combined-cycle technology, the AEC CCGT can also run as a baseload facility, as needed, providing greater reliability to meet Resource Adequacy needs for the southern California electrical system. As an in-basin generating asset, the AEC will provide local generating capacity, voltage support, and reactive power that are essential for transmission system reliability in the Western Los Angeles Basin sub-area and greater Los Angeles basin local reliability area. The AEC will be able to provide system stability by providing reactive power, voltage support, frequency stability, and rotating mass in the heart of the critical Western Los Angeles local reliability area. By being in a transmission constrained load center, the AEC also helps to avoid potential transmission line overloads and can provide reliable local energy supplies when electricity from more distant generating resources are constrained or otherwise unavailable.

The fast-starting, flexible AEC SCGT will be available to help facilitate renewable generation and provide additional capacity in this critical Southern California reliability area. These LMS units will help "shape and firm" renewable resources, providing much needed grid reliability. The AEC SCGT will have the ability to ramp up to full power in less than 60 seconds when operating above minimum turndown, providing fast response to load demand variations. In addition to individual dispatch capabilities, these units can provide valuable services to the grid, including, capacity, frequency response, voltage support, reactive power, inertia, and other ancillary services.

The AEC's combustion turbines, auxiliary boiler, and associated equipment will include the use of best available control technology to limit emissions of criteria pollutants and hazardous air pollutants. By being able to deliver flexible operating characteristics across a wide range of generating capacity, at relatively consistent and superior heat rates, the AEC will help lower the overall greenhouse gas (GHG) emissions resulting from electrical generation in southern California and allow for greater integration of intermittent renewable resources, thereby advancing California's goal of reducing GHGs from the electricity system.

Construction of the AEC will require the use of onsite laydown areas, approximately 8 acres dispersed throughout the existing AGS property, and an additional approximately 10-acre laydown area located adjacent to the AGS property south of existing generating Units 5 and 6. The demolition of the existing and operating AGS units is not necessary for construction of AEC. Existing AGS Units 1 through 6 are currently in operation and will continue to provide essential electrical service concurrent with the construction of the AEC CCGT. Units 1, 2, and 5 would be retired once the AEC CCGT commences operation. Units 3, 4, and 6 will likely operate through at least December 31, 2020.

A portion of the AEC will occupy land formerly used for former AGS Unit 7 (a retired turbine peaking unit). The generating components and most of the related facilities for former Unit 7 have been already decommissioned, demolished, salvaged, and removed from the site. However, some components of the balance of plant for former Unit 7 remain on-site, including certain buildings, foundations, and balance of equipment, including underground water, fuel and other lines (referred to in this Supplemental Application for Certification [SAFC] as the "former Unit 7's remaining components"), and fuel tank. These buildings and equipment, along with two retention basins and two small maintenance shops, will be demolished and removed from the site as part of the site preparation activities for the AEC.

Construction activities at the AEC site are anticipated to last 57 consecutive months (56 actual months of construction). The project will commence with site preparation and the removal of former Unit 7's remaining components. Site preparation will commence in the first quarter of 2017 and will be completed in the third quarter of 2021.

Owing to the critical need for generating capacity at the AGS site at all times, existing Units 1 through 6 will remain in operation through much of the AEC development and construction. Given the land available, the need for regulatory approval before the existing AGS can be taken out of service, and the fact that the existing Units 1 through 6 do not need to be removed to enable the construction of the AEC, the existing power plant will not impede construction of AEC.

The AEC CCGT will be located on the southern-most portion of the AEC site, on the former AGS fuel oil storage site, which was sold, then reacquired by the Applicant in late 2014. AEC CCGT will include the following principal design elements:

- Two General Electric (GE) 7FA.05 CTGs with a nominal rating of 227 MW each. The CTGs will be equipped with evaporative coolers on the inlet air system and dry low oxides of nitrogen (NO_x) combustors
- One, single-flow, impulse, down exhaust condensing STG with a nominal rating of approximately 229 MW
- Two HRSGs of the horizontal gas flow, triple-pressure, natural-circulation type; each HRSG will be equipped with a selective catalytic reduction (SCR) unit in the ductwork for the control of NO_x emissions and an oxidation catalyst to control carbon monoxide (CO) and volatile organic compound (VOC) emissions, and the HRSGs will not employ supplemental firing
- One air-cooled condenser and a closed-loop fin-fan cooler
- Natural gas compressor
- One generator step-up (GSU) transformer per each GE 7FA gas turbine and one for the steam turbine
- One 230-kilovolt (kV) interconnection to the existing SCE switchyard, which is adjacent to the site

The AEC SCGT will be located on the northern portion of the AEC site, adjacent to the San Gabriel River. The AEC SCGT will include the following principal design elements:

- Four GE LMS 100 PB natural-gas-fired CTGs with a nominal rating of 100 MW each

- Each CTG is equipped with SCR equipment containing catalysts to further reduce NO_x emissions, and an oxidation catalyst to reduce CO and VOC emissions
- Auxiliary equipment associated with each CTG will include an inlet air filter house with evaporative cooler, turbine inter-cooler, and associated intercooler circulating pumps
- Two CTGs will share one fin-fan heat exchanger and one GSU transformer
- Natural gas compressors
- One 230-kV interconnection to the existing onsite SCE 230-kV switchyard

The two power blocks will share the following design elements:

- Direct connection to an existing Southern California Gas (SoCalGas) 30-inch-diameter natural gas pipeline and metering station
- Connection to existing onsite municipal and industrial water lines
- Fire water and suppression systems
- An existing stormwater retention pond
- Water treatment and storage systems

Project Utilities

Natural gas will be supplied to the AEC via the existing 30-inch-diameter pipeline that currently serves existing Units 5 and 6. No new offsite natural gas supply pipelines will be necessary for the project. The existing natural gas pipeline is owned and operated by SoCalGas. The pipeline operates at a nominal pressure of 165 pounds per square inch, and enters the existing AGS property at the northeast corner of the AGS near the existing 230-kV switchyard. The existing gas metering station and ancillary equipment will be retained for the existing units and a new gas metering station will be constructed on the northeast corner of the site. The natural gas will flow into the new gas metering station and then to a new gas pressure-control station and gas scrubber/filtering equipment that will be constructed by the Applicant as part of the project. Natural gas will then be distributed onsite to the combustion turbine fuel gas compressors and, subsequently, the combustion turbines.

Water for the site is supplied from two separate existing Long Beach Water Department (LBWD) pipeline interconnections. Because the AEC's combined-cycle technology requires much less water than the existing AGS's boiler systems, the AEC's water requirements are significantly less than the existing generating station's current use. All of the existing connections will be used to support the AEC. No new offsite water supply pipelines will be required for the project.

The project's only offsite linear is an offsite pipeline for discharge of plant process and sanitary wastewater to the Sanitation Districts of Los Angeles County (LASCD) via the LBWD sewer system. A new 1,000-foot-long, 6-inch-diameter pipeline will connect the AEC to the existing LBWD sewer system. The new, offsite pipeline will commence at the west side of the site near the intersection of Studebaker Road and the northern cooling water canal. The pipeline will cross under Studebaker Road then turn south to the intersection with Loynes Drive. The pipeline will then turn west and will cross over the Los Cerritos Channel (affixed to the bridge). After crossing the channel, the pipeline will turn north on East Vista Street to connect into the existing system in the residential subdivision.

Stormwater from the AEC power blocks will be directed to two new oil/water separators and sumps, then to the southernmost existing onsite retention basin before being discharged to the existing stormwater outfalls, which discharge into the AGS cooling water canals and ultimately to the Los Cerritos channel.

Fire protection water will be provided by two sources: the primary source will be supplied via a connection to the existing water distribution system and the secondary source will be supplied from a new, onsite fire/service water storage tank, which will be operated in accordance with National Fire Protection Association (NFPA) guidelines to provide 2 hours of protection for the onsite worst-case single fire. New onsite fire water piping and hydrants will be constructed for the AEC as necessary. Existing fire protection service, fire water pumps, and hydrant lines will also remain in service for the AGS.

A. Generating Technology

Combined-Cycle Combustion Turbine Generators

Natural gas combustion in the CTGs will produce thermal energy, which is converted into mechanical energy required to drive the combustion turbine compressors and two electrical generators. Each CTG system will contain supporting systems and associated auxiliary equipment.

Each combustion turbine will drive a hydrogen cooled synchronous generator. Each CTG will be equipped with the following systems and components:

- Inlet air filters, inlet silencers, and evaporative coolers
- Metal acoustical enclosure
- Lubrication oil system for the combustion turbine and the generator
- Dry low-NO_x combustion system
- Compressor wash system
- Fire detection and protection system (using either carbon dioxide or water mist spray)
- Fuel gas system, including flow meter, strainer, and duplex coalescing filter
- Static Starter system
- Turbine controls
- Hydrogen-cooled synchronous generator
- Generator controls, protection, excitation, power system stabilizer, automatic voltage regulator (AVR), and automatic generation control

The CTGs and accessory equipment will be contained in acoustical enclosures for noise reduction.

Heat Recovery Steam Generators

The HRSGs will transfer heat from the exhaust gases of the CTGs to the feedwater to produce high-pressure (HP), intermediate pressure (IP), and low-pressure (LP) steam. Each HRSG is a triple pressure, reheat, natural circulation horizontal unit equipped with inlet and outlet ductwork, insulation, lagging, SCR/oxidation catalyst assemblies, and exhaust stack. The HRSGs will not employ duct burners.

Condensate will be pumped from the air-cooled condenser receiver tank through the HRSG low temperature economizer to the LP evaporator and then to the LP steam drums. Steam from the LP drum will flow through superheater sections and then enter the LP section of the steam turbines.

The LP drums will provide suction to the feedwater pumps, which will provide feedwater to the HP and IP sections of the HRSG. The HP and IP sections each contain economizer sections, evaporator sections, drums, and superheater sections. HP superheated steam is furnished to the HP section of the steam turbine. HP turbine exhaust steam, called cold reheat, is sent back to the HRSG where it is reheated in the HRSG reheater section, combined with the HRSG superheater IP steam, and then is sent to the steam turbine IP section. Attemperation will be provided upstream of all final HRSG superheater sections to control the steam temperature to the steam turbine.

Steam Turbine System

The steam turbine system consists of a condensing steam turbine, gland steam seal system, lubricating oil system, hydraulic control system, and steam admission/induction valves.

The steam turbine is a triple pressure, reheat, side exhaust turbine with a totally enclosed water to air-cooled generator. Turbine configuration is a single combined HP/IP casing and a single double flow LP turbine. Steam is admitted through a combined main steam stop/control valve and a combined reheat stop/control valve. A separate LP steam induction point is also provided. Standard acoustical enclosures are provided for the HP/IP section and the generator.

SCGT Combustion Turbine Generators

Natural gas combustion in the CTGs will produce thermal energy, which is converted into mechanical energy required to drive the combustion turbine compressors and electrical generators. Each CTG system will contain supporting systems and associated auxiliary equipment.

The combustion turbine will drive an air-cooled, three-phase, two-pole synchronous generator.

The CTGs will be equipped with the following systems and components:

- Inlet air filters, and evaporative coolers
- Intercooler
- Weather proof acoustical enclosure
- Lubrication oil system for the combustion turbine and the generator
- Dry low-NO_x combustion system
- Oxidation catalyst and SCR emissions control systems
- Compressor wash system
- Fire detection and protection system (using carbon dioxide)
- Fuel gas system, including strainer, and duplex filter
- Starter system
- Fire Protection System
- Turbine controls
- Generator controls, protection, excitation, power system stabilizer, and automatic generation control for each generator

The CTGs and accessory equipment will be contained in acoustical enclosures for noise reduction.

B. Major Electrical Equipment and Systems CCGT Block

Electric power produced by the AEC CCGT will be transmitted to the electrical grid through the 230-kV generation tie line connecting the project to the existing onsite SCE switchyard. A small amount of electric station power will be used onsite to power auxiliaries such as gas compressors, pumps and fans, control systems, and general facility loads including lighting, heating, and air conditioning. A station battery system also will be used to provide direct current (DC) voltage as backup power for control systems and other critical uses. Transmission and auxiliary uses are discussed in the following subsections.

Alternating Current (AC) Power—Transmission

Power will be generated by the two CTGs and one STG at 13.8-kV and stepped up by sixteen fan-cooled GSU transformers to 230-kV for transmission to the grid. Auxiliary power will be fed from the 13.8-kV bus through multiple separate station unit service transformers, which will step the power down to 4.16 kV for onsite use. Each CTG will have a 13.8-kV generator circuit breaker, located on the generator output, to isolate and synchronize the CTG to the grid during startup. Surge arresters will be provided at the high-voltage bushings to protect the transformers from surges on the 230-kV system caused by

lightning strikes or other system disturbances. The transformers will be set on concrete pads within berms designed to contain the transformer oil in the event of a leak or spill. The high-voltage side of the GSU transformers will be connected to SCE switchyard circuit breakers and associated equipment with the SCE high-voltage transmission system.

AC Power—Distribution to Auxiliaries

Auxiliary power for the AEC is supplied at 4.16-kV and 480 volts AC by a double-ended, 4.16-kV switchgear lineup and a double-ended, 480-volt load center substation arrangement. Two mineral-oil-filled, 13.8-kV/4.16-kV station unit service transformers on each power block will supply primary power to the switchgear and then subsequently to large motor loads and to the 4.16-kV side of the 4.16-kV/480-volt, mineral oil-filled load center transformers. The high-voltage side of the station unit service transformers will be connected to a tap on the 13.8-kV isolated phase bus duct, which connects the generator to the respective GSU transformer low voltage (secondary) winding. The 4.16-kV switchgear lineup will supply power to the large motor loads and to the load center transformers for 480-volt power distribution. The 4.16-kV switchgear will have vacuum interrupter circuit breakers for the main incoming feeds and for power distribution.

Each load center transformer will be mineral-oil-filled and will supply 480-volt, three-phase power to the CTG and balance-of-plant 480-volt motor control centers (MCC).

The MCCs will provide power through feeder breakers to the various 480-volt motor loads, and other low-voltage plant loads, including 480-volt power distribution panels, and lower-voltage lighting and distribution panel transformers. Power for the AC power supply (240-volt/120-volt) system will be provided by the 480-volt MCCs and 480-volt power panels. Dry-type transformers will transform 480-volt power to 240/120-volt power.

The fuel gas compressors will receive their power at 13.8 kV via a separate auxiliary connection that will be tied to the 13.8-kV bus duct between the generator output breakers and the GSU low-voltage connection.

Essential Services Bus

A 480-volt AC bus will provide power to essential loads, which will include, but will not be limited to, ventilation, critical lighting, and a charger to the 125-volt DC power supply system. Each of the four power blocks will have a 480-volt AC bus.

125-volt DC Power Supply System

Each power block will have a 125-volt DC power supply system consisting of one battery bank, a battery charger, and one or more distribution panels. The panels will supply DC pumps, circuit breaker line power, and an uninterruptible power supply (UPS) system. Each power block DC bus will be connected with a tiebreaker. Each CTG and the plant switchyard will be provided with its own separate battery systems, chargers, and panel boards.

Under normal operating conditions, the essential services buses provide 480-volt, three-phase AC power to the battery chargers and continuously charge the battery banks while supplying power to the DC loads.

Under abnormal or emergency conditions, when power from the essential services bus is unavailable, the batteries supply DC power to the DC system loads. Recharging of a discharged battery occurs whenever 480-volt power becomes available from the essential services bus. The rate of charge depends on the characteristics of the battery, battery charger, and the connected DC load during charging. The anticipated maximum recharge time will be 24 hours.

Uninterruptible Power Supply System

Each power block will have a critical service 120-volt AC, single-phase, 60-hertz bus. It will be powered through the UPS system to supply AC power to instrumentation and loads which will include, but not be limited to, distributed control system (DCS) operator stations, DCS controllers, the continuous emissions monitoring system, and protection and safety systems.

A UPS inverter will supply 120-volt AC single-phase power to the UPS panel boards that supply critical AC loads. The UPS inverter will be fed from the station 125-volt DC power supply system and alternatively from the essential services bus through a transformer. The UPS system will consist of one full-capacity inverter, a static transfer switch, a manual bypass switch, an alternate source transformer, and one or more panel boards.

The normal source of power to the system will be from the 125-volt DC power supply system through the inverter to the UPS panel board. A solid-state static transfer switch will continuously monitor the inverter output and the alternate AC source. The transfer switch will automatically transfer essential AC loads without interruption from the inverter output to the alternate source upon loss of the inverter output.

C. Major Electrical Equipment and Systems SCGT Power Block

AC Power—Transmission

The SCGT power block will consist of two sets of two CTGs operating at 13.8 kV and connected to a three-winding GSU transformer by way of isolated-phase bus duct. Each CTG will have a 13.8-kV generator circuit breaker located in-line in the isolated-phase bus duct to synchronize the CTG to the grid during startup. Each GSU transformer will step the output voltage of two CTGs to 230 kV for transmission to the grid. Each of the two GSU transformers will be connected to a 230-kV collector bus through 230-kV gas circuit breakers. The collector bus includes a 230-kV line disconnect switch to isolate the collector bus from the transmission system.

Surge arresters will be provided at the high-voltage bushings of the GSU transformers to protect from surges on the 230-kV system caused by lightning strikes or other system disturbances. The transformers will be set on concrete pads within berms designed to contain transformer oil in the event of a leak or spill.

AC Power—Distribution to Auxiliaries

Auxiliary power for the power block is provided by two 13.8-4.16-kV unit auxiliary transformers (UATs) per CTG set. The high voltage winding of the UATs is tapped off of the CTG isolated phase bus duct. The low voltage winding is connected to a lineup of 4,160-volt metal clad switchgear by way of nonsegregated phase bus duct. The 4,160-volt switchgear consists of a main vacuum circuit breaker and bus, combination vacuum motor starters for the larger plant motors ($\geq$200 horsepower [hp]), and a vacuum feeder breaker that supplies a 4,160-480-volt unit substation transformer (UST). All circuit breakers and motor starters are electrically operated.

The 480-volt switchgear consists of a main air circuit breaker and feeder breakers that supply one or more MCC. The 480-volt MCC(s) consists of combination magnetic motor starters for the smaller plant motors (< 200 hp) and feeder breakers for miscellaneous plant loads. These loads include 120/240-volt single-phase and/or 120/208-volt three-phase load centers (distribution transformer/panelboards) as required. A single 120-volt UPS is also provided for critical loads, such as the turbine and BOP control systems.

125-volt DC Power Supply System

The power block will have two 125-volt DC systems, each consisting of one battery bank, a battery charger, and one or more distribution panels. The panels will supply DC pumps, the 4,160-volt

switchgear, and other miscellaneous loads. The battery and battery charger are sized to supply the entire power block in the event of loss of a charger. A tiebreaker and interconnecting cable are provided between the DC systems for this purpose. The plant switchyard will be provided with its own 125-volt DC system for GSU transformer, bus and transmission line protection, control, and communications.

Uninterruptible Power Supply System

The power block will be provided with two packaged, 120-volt AC, single-phase UPS systems to supply critical 120-volt AC loads, such as the BOP DCS, the continuous emissions monitoring system, and life safety systems.

Each UPS will be supplied at 480-volt, which is rectified to charge an integral battery and supply a 480-volt output inverter. The inverter output voltage is stepped down with a stand-alone 480-120-volt output transformer, which in turn supplies a main 120-volt AC UPS distribution panel.

In the event of loss of the 480-volt supply to the UPS, critical loads will continue to be served uninterrupted, by way of the integral UPS battery and inverter. The battery is typically sized to provide three hours of backup power at rated output. In the event of failure of the output inverter, the UPS contains an internal solid-state bypass switch that will automatically connect the 480-volt supply directly to the 480-120-volt output transformer, bypassing the UPS rectifier/battery/inverter altogether.

Each UPS system includes a manual maintenance bypass arrangement that will connect a separate source of 480-volt power directly to the output transformer and isolate the UPS for maintenance or replacement.

Alternate Power Source

The AEC will not utilize an alternate power source.

Fuel System

The CTGs will be designed to burn natural gas only. The natural gas requirement during full load operation at site annual average ambient temperature conditions is approximately 8,137 million British thermal units per hour (MMBtu/hr), higher heating value (HHV).

D. Plant Cooling Systems

CCGT Plant Cooling

The steam turbine cycle heat rejection system will consist of an air-cooled condenser, which will eliminate the need for ocean water for once-through cooling. The heat rejection system will receive exhaust steam from the low-pressure section of the steam turbine and condense it to water (condensate) for reuse.

Balance of plant systems will be cooled by closed-loop fluid coolers using water. CTG, STG, gas compressors, and other balance-of-plant auxiliary equipment requiring cooling will be integrated into the closed cooling water loop.

SCGT Plant Cooling

The simple-cycle heat rejection system will consist of one air-cooled, closed loop fluid cooler per two CTGs to reject waste heat from the intercooler and other gas turbine auxiliaries.

Water Use

For the site average ambient conditions, AEC will use approximately 68 gallons per minute (gpm) and the maximum water consumption at the highest ambient conditions water use will be 357 gpm. The maximum annual AEC water consumption will be 130 acre-feet per year.

Makeup water for the steam cycle will have contaminants removed (demineralized) by passing the service water through a reverse osmosis system followed by an electrodeionization (EDI) system. The deionized water will be sent to a new demineralized water storage tank. Deionized water is used for feedwater makeup for the steam cycle. Feedwater makeup water will be deaerated and fed to the condensate receiver or the condensate storage tank. Blowdown (condensate removed from the HRSGs to reduce water contaminants) will be discharged to an atmospheric flash tank where the flash steam will be vented to atmosphere and the condensate will be cooled prior to transfer to the service water storage tank for reuse.

Wastewater from combustion turbine water washes will be collected in combustion turbine drain tanks and then trucked offsite for disposal. Service water will be used for makeup to the combustion turbine evaporative coolers, equipment washdown, and other miscellaneous plant uses.

Blowdown from the combustion turbine evaporative coolers will be discharged to the plant process drain system and directed to the service water storage tank for reuse. The unused portion will ultimately be discharged to the sewer.

Stormwater from process areas that could potentially include oil or other lubricants will be directed to an oil/water separator for removal of accumulated oil that may result from equipment leakage or small spills and large particulate matter that may be present from equipment washdowns. The oil-free stormwater from the process areas and from the pavement areas will be directed to an existing retention basin and then discharged to the existing outfalls. The residual oil-containing sludge will be collected via vacuum truck and disposed of as hazardous waste.

The AEC CCGT and AEC SCGT will have closed-loop cooling systems that will provide cooling water for various plant equipment, such as the CTG and STG generator coolers, CTG and STG lubrication oil coolers, AEC SCGT intercoolers, and boiler feedwater pumps. The primary means of heat rejection for this closed-loop system will be air-cooled heat exchangers. The air-cooled heat exchangers will use large fans to blow ambient air across finned tubes through which the closed-loop cooling water will flow. The air-cooled heat exchanger will consume minimal water.

E. Fire Protection

The existing fire protection system will be modified for the AEC site and the rest of the AGS property and equipment to meet all laws, ordinances, regulations, and standards (LORS) while reusing existing equipment to the maximum extent possible. The system design will protect personnel and limit property loss and plant downtime in the event of a fire. The primary source of fire protection water will be supplied via a connection to the existing water distribution system. A new 8-inch onsite fire water loop and hydrants will be constructed around each of the new power blocks and tied into existing on site firewater hydrant lines. No new offsite linears will be needed for fire protection.

The secondary source of fire protection water will be supplied from the 600,000-gallon service water storage tank, which will provide 2 hours of protection for the onsite worst-case single fire.

Two existing electric fire pumps, connected to two independent power feeds from SCE distribution system, will be provided to pump water from the onsite storage tank. Fire protection water from the existing water supply connection and service water storage tank will be provided to a dedicated underground fire loop piping system. Fixed fire-suppression systems will be installed at determined fire risk areas. Sprinkler systems also will be installed in the administration and maintenance buildings as required by NFPA and local code requirements. The CTG units will be protected by a carbon dioxide fire protection system. Hand-held fire extinguishers of the appropriate size and rating will be located in accordance with NFPA 10 throughout the facility.

F. Interconnection to the Electrical Grid

For the AEC CCGT, the two CTGs and one STG will be connected to three separate two-winding, three-phase, GSU transformers. For the AEC SCGT, each pair of CTGs will be connected to one GSU transformer. The SCE switchyard will contain new 230-kV circuit breakers and air break disconnect switches to interconnect the new AEC units to the SCE 230-kV transmission system.

G. Construction Schedule and Workforce

For the AEC CCGT, there will be an average and peak workforce of approximately 182 and 306, respectively, of construction craft people, supervisory, support, and construction management personnel onsite during construction.

For the AEC SCGT, there will be an average and peak workforce of approximately 222 and 512, respectively, of construction craft people, supervisory, support, and construction management personnel onsite during construction.

The construction plan is based on a single shift composed of a 10-hour workday, Monday through Friday, and a single 8-hour shift on Saturday. Construction will typically take place between the hours of 7:00 a.m. and 7:00 p.m., Monday through Friday, and 9:00 a.m. and 6:00 p.m. on Saturday, consistent with City of Long Beach ordinances. Overtime and additional shift work may be used to maintain the construction schedule or to complete critical construction activities (for example, pouring concrete at night during hot weather, working around time-critical shutdowns and constraints). During the commissioning and startup phase of each of the power blocks, some activities may continue 24 hours per day, 7 days per week.

III. Facility Operation

The facility will be capable of being dispatched throughout the year and will have annual availability above 98 percent.

The AEC will employ a staff of 36 to operate the facility. Staff will include power plant operators, supervisors, administrative personnel, mechanics, and electricians. Operational staff will work in three rotating shifts with administrative and supervisory staff working 8-hour shifts, 5 days a week. The facility will be capable of operating 24 hours per day, 7 days per week.

A. Facility Reliability

This section discusses the expected facility availability, equipment redundancy, fuel availability, water availability, and project quality control measures.

B. Facility Operating Range and Availability

The AEC will be designed to operate between about 5 and 100 percent of maximum load to support dispatch service in response to customer demands for electricity. The AEC will be designed for a minimum operating life of 30 years. Reliability and availability projections are based on this operating life. Operation and maintenance procedures will be consistent with industry standard practices to maintain the operating life status of plant components.

The percent of time that the power plant is projected to be operated is defined as the "service factor." The service factor considers the amount of time that a unit is operating and generating power, whether at full or partial load. The projected service factor for the power plant, which considers projected percent of time of operation, differs from the equivalent availability factor (EAF), which considers the projected percent of energy production capacity achievable.

The EAF may be defined as a weighted average of the percent of full energy production capacity achievable. The projected equivalent availability factor for the AEC is estimated to be approximately 98 percent. The EAF differs from the "availability of a unit," which is the percent of time that a unit is available for operation, whether at full load, partial load, or standby.

C. Redundancy of Critical Components CCGT

The following subsections identify equipment redundancy as it applies to AEC CCGT availability. Specifically, redundancy in the AEC CCGT and in the balance-of-plant systems that serve it is described. The AEC CCGT will be served by the following balance-of-plant systems: fuel supply system, DCS, boiler feedwater system, condensate system, deionized water system, power cycle makeup, and storage, steam condensing system, closed-cycle cooling water system, and compressed air system.

Combined-Cycle Gas Turbine

Two CTG/HRSG power generation trains will operate in parallel within the combined-cycle gas turbine. Each train will be powered by a CTG. Each CTG will provide approximately 35 percent of the total AEC CCGT output. The heat input from the exhaust gas from each CTG will be used in the steam generation system to produce steam. Thermal energy in the steam from the steam generation system will be converted to mechanical energy and then to electrical energy in the STG subsystem. The expanded steam from the STG will be condensed and recycled to the feedwater system. Power from the STG subsystem will contribute approximately 30 percent of the total unfired AEC CCGT output (assuming both CTG/HRSG trains are operating).

D. Redundancy of Critical Components SCGT

Redundancy in the AEC SCGT and in the balance-of-plant systems that serve it is described. The AEC SCGT will be served by the following balance-of-plant systems: fuel supply system, DCS, closed-cycle cooling water system, and compressed air system.

E. Fuel Availability

Fuel will be delivered via the existing SoCalGas 30-inch-diameter gas pipelines. SoCalGas has confirmed that its system has enough capacity to supply the AEC at this location.

F. Water Availability

The AEC will use a maximum of 130 acre-feet per year of water provided by the LBWD for power plant process water, fire protection, and potable uses.

G. Sewer and Wastewater Treatment Availability

The AEC will discharge a maximum of 11 acre-feet per year of wastewater, consisting of process and sanitary wastewater. Sanitary wastewater and process water will be discharged to the public sewer system.

IV. Electric Production and Thermal Efficiency

While the AEC's annual electrical production for the years 2020 and beyond cannot be forecasted with certainty, due to the efficiency of the plant and given the operating characteristics as described above, the AEC is expected to have a plant capacity factor of approximately 50 percent. The maximum annual generation possible from the facility is estimated to be approximately 3,744 gigawatt hours per year (based on a nominal base load megawatt ratings of 640 MWs for the AEC CCGT for 4,600 hours per year and 400 MWs for the AEC SCGT for 2,000 hours per year).

A. Thermal Efficiency CCGT

The maximum gross thermal efficiency that can be expected from the CCGT configuration specified for AEC is approximately 56 percent on a lower heating value (LHV) basis. This level of efficiency is achieved when the facility is base-loaded. Other types of operations, particularly those at less than full gas turbine output, will result in lower efficiencies. However, the AEC design achieves a very high level of efficiency across a wide range of generating capacity. The basis of AEC operations will be system dispatch within California's power generation and transmission system. It is expected that the AEC CCGT will be primarily operated in load-following or cycling service. The number of startup and shutdown cycles is expected to range between 50 and 500 per year per CTG.

B. Thermal Efficiency SCGT

The maximum gross thermal efficiency that can be expected from the SCGT configuration specified for AEC is approximately 41 percent on a LHV basis. This level of efficiency is achieved when the facility is base-loaded. Other types of operations, particularly those at less than full gas turbine output, will result in lower efficiencies. However, the AEC design achieves a very high level of efficiency across a wide range of generating capacity. The basis of AEC operations will be system dispatch within California's power generation and transmission system. It is expected that the AEC SCGT will be primarily operated in load-following or cycling service. The number of startup and shutdown cycles is expected to range between 50 and 400 per year per CTG.

V. Response to Certain Issues Raised in the FSA

No comments on the FSA.

VI. Proposed Licensing Conditions

No Conditions of Certification are proposed for Project Description.

Transmission System Engineering

I. Introduction

A. Name: Rob Sims

B. Qualifications: The panel's qualifications are as noted in their resume contained in Appendix A.

C. Prior Filings: In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Data Adequacy Supplement (TN #201751), February 17, 2014.
- CH2M HILL, Alamitos Energy Center (13-AFC-01) Staff Query 1 – Transmission and Project Description (TN #202163), April 21, 2014.
- CH2M HILL, Alamitos Energy Center (13-AFC-01) Data Response Set 3 – Responses to CEC Staff Data Requests 69 and 70 (TN #202978), August 25, 2014.
- AES Alamitos Energy, LLC, Supplemental Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #206427-1 through 206427-6 and 206428-1 through 206428-3), October 23, 2015.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Data Responses, Set 6 (Response to Data Requests 83 to 168) (TN #207013), December 14, 2015.
- California Energy Commission, Report of Conversation: Data Responses to CEC DR #6, TSE DR. #160, 161 & 163 (TN #210528), January 26 and 29, 2016.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Data Responses, Set 6A (Revised Responses to Data Requests 160, 161, and 163) (TN #210229), February 8, 2016.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Data Responses, Set 8 (Response to Data Request 170-175) (TN #210766), March 17, 2016.
- AES Alamitos Energy, LLC, AEC CAISO Section 25.1 Affidavit Application (TN #211006), April 8, 2016.
- Ellison, Schneider & Harris LLP, Alamitos Energy Center (13-AFC-01) Supplement to Data Responses, Set 8 (Response to Data Request 170-175) (TN #212242), July 12, 2016.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Preliminary Staff Assessment Initial Comments (TN #212487), July 27, 2016.
- California ISO, Alamitos Energy Center Project 25.1.2 Repowering Request (TN #213941), September 27, 2016.

The facts contained in this testimony (including all referenced documents) are true and correct to the best of my knowledge and belief. To the extent this testimony contains opinions, such opinions reflect my best professional judgment. I make these statements, and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

II. Summary of Testimony

A. Affected Environment

The AEC will be located on an approximately 21-acre site within the larger 71.1-acre parcel for the existing AGS. This site is located in an industrial-zoned area within Long Beach, California. Access to the AEC site will be provided via an existing entrance off North Studebaker Road, just north of the intersection of Westminster Avenue and North Studebaker Road.

The AEC will connect to the regional electrical grid using the existing SCE 230-kV switchyard, located on a parcel owned by SCE within the existing AGS site. The AEC CCGT and AEC SCGT will connect into the existing SCE switchyard via two new single-circuit 230-kV lines. No new offsite transmission lines will be required for the AEC. Similarly, no changes are planned for the existing transmission line circuits connecting the SCE/California Independent System Operator (CAISO)-controlled switchyard to the CAISO transmission system.

B. Potential Construction and Operational Related Impacts; Avoidance and Minimization Measures

AEC Switchyard Characteristics

AEC will have a 230-kV switchgear to receive power from each generator unit and step-up transformer, and to combine and meter the power for delivery to the SCE substation located onsite. The generation block switchgear will be an outdoor conventional design and utilize standard utility grade equipment and designs. The substation will conform to the requirements of National Electrical Code (NEC) and National Electrical Safety Code (NESC) as well as local code requirements for seismic integrity. Station service power will be provided via the onsite SCE 230-kV switchyard with emergency back-up power from the local SCE distribution network.

AEC Interconnect Characteristics

AEC generation tie lines will use 230-kV isolation switches and gas-insulated circuit breakers for each block, and individual GSU transformers for each of the generating units within each power block. All generation tie lines from the AEC to the SCE switchyard will be constructed as overhead lines. No underground generation tie lines are proposed. The generation tie lines to the SCE switchyard and all equipment will be designed to ensure compliance with applicable NEC and NESC rules following CAISO requirements. Standby power for the AEC, when not generating, will be back-fed through the GSU transformer and auxiliary transformer.

Transmission Interconnection Studies

AES submitted a repowering request to the CAISO on April 8, 2016 for two scenarios under Section 25.1.2 of the CAISO Tariff: operation of the 689 MW CCGT, 403.2 MW SCGT, and 300 MW Battery Energy Storage System (BESS) or operation of only the 689 MW CCGT. The repowering request was approved by CAISO on September 27, 2016.

Transmission Line Safety

Typical high-voltage overhead transmission lines are composed of bare conductors connected to supporting structures by means of porcelain, glass, or polymer insulators. The air surrounding the energized conductor acts as the insulating medium. Maintaining sufficient clearances, or air space, around the conductors to protect the public and utility workers is paramount to the safe operation of the transmission line. The required safety clearance required for the conductors is determined by considering various factors, such as the normal operating voltages, conductor temperatures, short-term

abnormal voltages, wind-blown swinging conductors, contamination of the insulators, clearances for workers, and clearances for public safety. The 230-kV generation tie lines connecting the AEC power blocks to the SCE switchyard will be designed to meet appropriate national, state, and local clearance requirements.

Electric and Magnetic Fields and Audible Noise

In the absence of conclusive or evocative evidence, California has chosen not to specify maximum acceptable levels of electromagnetic force (EMF). Instead, California mandates a program of prudent avoidance whereby EMF exposure to the public would be minimized by encouraging electric utilities to use cost-effective techniques to reduce the levels of EMF.

The new generation tie lines that connect the AEC power blocks to the existing SCE 230-kV switchyard are located within the existing AGS site and will not affect the public because they do not extend off the AEC site. The new generation tie lines will also be designed and constructed to reduce project-related audible noise and radio and television interference. Further, no changes are proposed for the transmission lines connecting the SCE switchyard to the CAISO transmission system. Additionally, the estimated electric field of the new AEC generation tie lines that connect to the existing SCE 230-kV switchyard are within the boundary of the existing AGS and the audible noise associated with the new AEC generation tie lines will be similar to or slightly less than the existing noise generated by the AGS.

Construction and operation of the AEC, including replacement of two of the existing generation tie lines connecting the AEC power blocks to the existing SCE switchyard, are not expected to result in significant changes in EMF levels, corona, audible noise, or radio and television interference.

C. Summary of Compliance with Applicable LORS

AEC is expected to comply with the LORS applicable to the project.

D. Summary of the Potential Cumulative Impacts

Compliance with LORS and codes in the design of the AEC will not create any significant adverse cumulative impacts.

III. Response to Certain Issues Raised in the FSA

No comments on the FSA.

IV. Proposed Licensing Conditions

The Applicant agrees with the Conditions of Certification for Transmission System Engineering (TSE-1 through TSE-5) and Transmission Line Safety and Nuisance (TLSN-1 through TLSN-3) set forth in the FSA.

Biological Resources

I. Introduction

A. Name: Melissa Fowler, M.S., Certified Ecologist, Ecological Society of America

B. Qualifications: The panel's qualifications are as noted in their resumes contained in Appendix A.

C. Prior Filings: In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- AES Southland Development, LLC, Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #201620-1 through 201620-72). December 27, 2013.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Data Adequacy Supplement (TN #201751), February 17, 2014.
- CH2M HILL, Alamitos Energy Center (13-AFC-01) Data Responses Set 1A – Responses to CEC Staff Data Requests 1-8, 10-12, 16-17, 20-25, 38-44, 51-54, and 59-62 (TN #202381), May 27, 2014.
- AES Alamitos Energy, LLC, Supplemental Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #206427-1 through 206427-6 and 206428-1 through 206428-3), October 23, 2015.
- AES Alamitos Energy, LLC, Alamitos Energy Center (13-AFC-01): Removal of Temporary Secondary Construction Access Road (TN #210632), March 7, 2016.
- AES Alamitos Energy, LLC, Alamitos Energy Center Supplemental Application for Certification (13-AFC-01) Revised Air Quality, Biological Resources, and Public Health Assessment (TN #211013), April 12, 2016.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Preliminary Staff Assessment Initial Comments (TN# 212487), July 27, 2016.
- CH2M HILL, Supplemental Rare Plant Survey for Alamitos Energy Center (TN #212917), August 23, 2016.

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of my knowledge and belief. To the extent this testimony contains opinions, such opinions reflect my best professional judgment. I make these statements, and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

II. Summary of Testimony

A. Affected Environment

The Applicant will construct, own, and operate the AEC—a natural-gas-fired, air-cooled, combined-cycle and simple-cycle, electrical generating facility in Long Beach, California. The AEC will be constructed on an approximately 21-acre brownfield site within the boundaries of the 71.1-acre AGS property. With the exception of a new 1,000-foot process/sanitary wastewater pipeline, all construction will occur within the AEC site. There is no natural habitat within the AEC site and all areas of the proposed project have been previously disturbed. The AEC site and pipeline alignment do not provide suitable habitat for special-status plant or wildlife species.

B. Potential Construction Related Impacts; Avoidance and Minimization Measures

1) **Construction and Demolition Impacts to Native Vegetation**

a) AEC will be located within an existing, operational industrial site that does not contain any natural habitats. Vegetation within the site and proposed pipeline route consist of landscape plants and weedy/ruderal vegetation.

b) Because there are no on-site natural habitats, construction of the AEC and demolition of the remaining components of AGS Unit 7, located on the AEC site (hereinafter described as "demolition"), would not result in significant impacts to native vegetation. Therefore, no mitigation is required.

2) **Construction and Demolition Impacts on Common Wildlife**

a) Direct loss and entrapment of common wildlife species could occur during project construction and demolition of the remaining components of AGS Unit 7, located on the AEC site. Therefore, the Applicant agrees with the implementation of Condition of Certification BIO-7, as proposed in the FSA, to reduce any potential impacts to less-than-significant levels.

b) Birds protected under the Migratory Bird Treaty Act (MBTA) and California Department of Fish and Wildlife Fish and Game Codes could nest within the AEC site and proposed pipeline alignment. Therefore, the Applicant agrees with the implementation of Condition of Certification BIO-8, as proposed in the FSA, to reduce any potential impacts to less-than-significant levels.

3) **Construction and Demolition Impacts on Special-Status Plants**

a) There is no habitat for special-status plant species within the AEC site and proposed pipeline alignment. Therefore, no mitigation is required.

4) **Construction and Demolition Impacts on Special-Status Wildlife**

a) There is no habitat for special-status wildlife species within the AEC site and proposed pipeline alignment.

b) Potential indirect impacts include noise and lighting disturbance, habitat degradation from weed infestations, stormwater runoff, or groundwater contamination. However, the Applicant agrees with Staff that these potential indirect impacts would not result in "take" under state and federal laws (FSA, pg 4.2-27).

i) **Noise -** The expected loudest composite noise levels from the AEC are approximately 70 A-weighted decibels (dBA)[1] at the AEC eastern fenceline, which will result in a noise level of 60 dBA at 400 feet from the eastern fenceline and 57 dBA at the Los Cerritos Wetlands located approximately 2,400 feet west of the AEC site. The following reasons are why noise impacts on avian species are not expected to be significant:

(1) The distance from the AEC power blocks to any potentially sensitive receptors, such as the Los Cerritos Wetlands, is approximately 2,400 feet. Noise levels would greatly decrease at that distance.

(2) Bird species hear less well than humans at low frequencies.

[1] Noise estimates are conservative, do not take into account the effect of blocking from structures, and assume a non-sound-absorbing ground surface.

(a) This is particularly important considering the fact that the majority of construction noise occurs at low frequencies.

(b) Avian species that occur in urban environments, such as within the vicinity of AEC, are noise tolerant compared to other noise-sensitive species, particularly those that will move away from noise sources and nest in more remote, undisturbed locations.

(c) Construction and demolition noises do not impact birds in the same way as humans, given bird anatomy and physiology. In the Huntington Beach Energy Project siting case, AES's witness, Dr. Robert Dooling, testified that human hearing would be graphed as roughly bowl-shaped, with people hearing less well at low and high frequencies. Bird hearing, when graphed in connection with human hearing, appears as a "V" shape in the middle of the bowl. The placement of the "V" in the graph is based on the frequencies at which birds vocalize. Construction noise occurs at low frequencies outside of the vocalization range of birds. Thus, concluded Dr. Dooling, birds are not as impacted by construction noise as humans. (07/21/14 RT 178:1-178:23; Ex. 1127.)

(3) Noise levels will also adhere to specific Conditions of Certification. Therefore, impacts will be mitigated to less-than-significant levels.

ii) **Other Potential Impacts**

(1) Lighting, construction dust, the spread of invasive weeds, stormwater runoff, and groundwater contamination will be reduced to less-than-significant levels with the implementation of Conditions of Certification.

5) Construction and Demolition Impacts to Jurisdictional Wetlands and Waters

a) AEC would not result in the direct fill or loss of any jurisdictional wetlands of waters of the state or U.S.

b) Any indirect impacts from site runoff and/or groundwater contamination will be mitigated through implementation of best management practices (BMPs) and a Stormwater Pollution Prevention Plan (SWPPP).

C. Potential Operational Related Impacts; Avoidance and Minimization Measures

As previously noted, the AEC is located within an existing, operational industrial area. Significant impacts to special-status plant and wildlife species are not anticipated for reasons listed throughout the preceding sections (also see documents listed in 1.C. *Prior Fillings*) and within the opening testimony. The AEC will adhere to LORS with implementation of the Conditions of Certification.

D. Summary of Compliance with Applicable LORS

AEC is expected to comply with the LORS applicable to the project. Additionally, mitigation measures (Conditions of Certification) would be implemented, as applicable, to reduce any potentially significant impacts to less-than-significant levels.

E. Summary of the Potential Cumulative Impacts

Potential cumulative impacts on biological resources from construction and operation of the AEC are not expected. The project will have a less-than-significant impact on biological resources in the immediate vicinity of the project site. Projects that could result in a cumulative impact would also be required to comply with applicable federal, state, and local LORS. The proposed project is unlikely to result in cumulative impacts to biological resources in combination with other closely related past, present, and reasonably foreseeable future projects.

III. Response to Certain Issues Raised in the FSA

1) The FSA's Biological Resources section states that construction and demolition activities could discourage special-status wildlife from foraging and nesting. The discouragement of nesting and foraging does not violate any LORS. However, the FSA does not mention the benefits noise-tolerant avian species have, such as the indirect facilitation of reproductive success from noise.[2] Furthermore, the FSA does not take into account additional information that has been presented regarding avian hearing and noise; however, we agree with the conclusion that construction and demolition noise impacts would be less-than-significant.

2) The FSA reviewed potential impacts on burrowing owl, primarily as a result of public comments received. However, the FSA does not acknowledge that the project site occurs outside of the known breeding range for this species (Shuford et al., 2008).[3] In addition, this species has been nearly extirpated as a breeding species in coastal San Luis Obispo, Santa Barbara, Ventura, Los Angeles, and Orange Counties (Shuford et al, 2008 and references therein). Based on this information and a lack of breeding burrowing owl within the area, specific mitigation should not be required for burrowing owls.

IV. Proposed Licensing Conditions

The FSA proposes eight Conditions of Certification for this subject matter. We agree with the Conditions of Certification set forth in the FSA for Biological Resources, except as set forth below.

A. Proposed Revisions to CONDITION BIO-1

The Staff rejected the Applicant's proposed changes to Condition BIO-1 for streamlining the Designated Biologist (DB) approval process based on the following reasoning.

1. The DB role is project and biological resource specific;
2. The DB qualifications may change over time; and
3. The proposed DB may have engaged in past behaviors that disqualify them from performing as a DB.

However, the proposed changes to Condition BIO-1 (shown below) address all three of these issues. The last sentence of the proposed changes allow for the DB to be disapproved for **documented** non-compliance or performance issues and for not having the applicable qualifications for the specific biological resources identified in the project area.

Additionally, the current DB qualifications require a bachelor's degree in biological sciences or closely related field, three years of experience in field biology (or current certification of a nationally recognized biological society), and at least one year of field experience with biological resources found in or near the project area. As the proposed changes to Condition BIO-1 require the submittal of a resume, it should not be difficult to determine if the proposed DB previously approved by the CEC within the last 5 years complies with the current DB qualifications. Therefore, the Applicant's proposed addition to Condition BIO-1 should be adopted, as follows:

BIO-1 …

[2] Francis, C.D., C.P. Ortega, and A. Cruz. 2009. Noise Pollution Changes Avian Communities and Species Interactions. *Current Biology* 19(16): 1415-1419.

[3] Shuford, W. D., and Gardali, T., editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

The Project Owner shall provide the Compliance Project Manager (CPM) with the resume and qualifications of its Designated Biologist (DB) for review and approval. A proposed DB previously approved by Commission Staff within the preceding five (5) years shall be deemed approved ten (10) days after project owner provides a resume and statement of availability of the proposed DB. The CPM may disapprove a previously approved DB within seven (7) days of Project Owner submission of the Proposed DB's resume and statement of availability only if non-compliance or performance issues events were documented in the compliance record for the previous CEC project work conducted by the proposed DB previously approved within the last five (5) years by the Commission shall be automatically approved and the project owner shall provide a resume and statement of availability. The CPM may disapprove a previously approved DB if non-compliance or performance issues were documented in the record during the previous project work by the DB or the DB's qualifications are not applicable to the specific biological resources identified in the project area.

B. Proposed Revisions to CONDITION BIO-8

As drafted, Condition BIO-8 suggests surveys need to be conducted during the entire year. The mitigation is not warranted for the following reasons:

1. Burrowing owls have not been detected within the AEC site and this is a diurnal species that would be easily spotted within an operating power plant. This species can also be detected more readily during peaks of activity in the morning and early evening (Conway and Simon, 2003)[4]
2. As previously noted, the AEC is located outside of the current breeding range for this species (Shuford et al., 2008). Therefore, no specific mitigation should be required because a specific impact has not been identified and some of the analyses are based on historic conditions that no longer are present.

Condition BIO-8 should be revised as follows:

BIO-8 Pre-construction nest surveys shall be conducted if construction or demolition activities on the project site or wastewater pipeline will occur from January 1 through August 31. ~~In addition, burrowing owl surveys shall be conducted prior to any ground disturbing activity year-round.~~ The Designated Biologist or Biological Monitor shall perform surveys in accordance with the following guidelines:

1. Surveys shall cover all potential nesting~~, burrow, or surrogate burrow~~ habitat and substrate within the project site and areas surrounding the project site within 300 feet of the project boundary.
2. At least two pre-construction surveys shall be conducted, separated by a minimum 10-day interval. Pre-construction surveys shall be conducted no more than 14 days prior to initiation of construction activity. One survey needs to be conducted within the 3-day period preceding initiation of construction activity. Additional follow-up surveys may be required if periods of construction inactivity exceed three weeks during January 1 through August 31 in any given area, an interval during which birds may establish a nesting territory and initiate egg laying and incubation.
3. If active nests~~, burrows, or surrogate burrows~~ are detected during the survey, a no-disturbance buffer zone (protected area surrounding the nest) shall be established around each nest. Specific buffer distances are provided below for applicable avian groups (**Biological Resources Table 5**); these buffers may be modified with the CPM's approval **and/or based on available**

[4] Conway, C.J. and J.C. Simon. 2003. Comparison of detection probability associated with burrowing owl survey methods. *Journal of Wildlife Management* 67(3): 501-511.

literature. For special-status species, if an active nest is identified, the size of each buffer zone shall be determined by the Designated Biologist in consultation with the CPM (in coordination with CDFW and USFWS). Nest locations shall be mapped using GPS technology.

[Table 5 has been excluded to reduce the amount of space used in this testimony]

1. If active nests are detected during the survey, the Designated Biologist or Biological Monitor shall monitor all nests with buffers at least once per week, to determine whether birds are being disturbed. If signs of disturbance or distress are observed, the Designated Biologist or Biological Monitor shall immediately implement adaptive measures to reduce disturbance in coordination with the CPM. These measures could include, but are not limited to, increasing buffer size, halting disruptive construction activities in the vicinity of the nest until fledging is confirmed, or placement of visual screens or sound dampening structures between the nest and construction activity.
2. If active nests are detected during the survey, the Designated Biologist will prepare a Nest Monitoring Plan. The Designated Biologist or Biological Monitor shall monitor the nest until he or she determines that nestlings have fledged and dispersed or the nest is no longer active. Activities that might, in the opinion of the Designated Biologist or Biological Monitor, disturb nesting activities (e.g., exposure to exhaust), shall be prohibited within the buffer zone until such a determination is made.

Verification: Within ten (10) **business** days of completion of the field work, the project owner shall provide the CPM, CDFW, and USFWS a letter-report describing the findings of the preconstruction nest surveys, including a description and representative photographs of habitat; the time, date, methods, and duration of the surveys; identity and qualifications of the surveyor(s); and a list of species observed. If active nests are detected during the surveys, the reports shall include a map or aerial photo identifying the location of the nest(s) and shall depict the boundaries of the proposed no disturbance buffer zone around the nest(s). The CPM will consider any timely comments received from CDFW and USFWS in review of the letter-report.

Additionally, the nest monitoring plan shall be submitted to the CPM for review and approval prior to any planned demolition or construction activities in the vicinity of any active nest. No such demolition or construction activities may proceed without CPM approval of the monitoring plan, in consultation with CDFW and USFWS. All impact avoidance and minimization measures related to nesting birds shall be included in the ~~BRMIMP~~ **nest monitoring plan a**nd implemented. Implementation of the measures shall be reported in the monthly compliance reports by the Designated Biologist.

Cultural Resources

I. Introduction

A. Name: Natalie Lawson

B. Qualifications: The panel's qualifications are as noted in their resumes contained in Appendix A.

C. Prior Filings: In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- Southern California Edison Company, Alamitos Generating Station Sampling and Analysis Plan, Wastewater Basin Closure Project (TN #207022), January 2013.
- AES Southland Development, LLC, Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #201620-1 through #201620-72), December 27, 2013.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Data Adequacy Supplement (TN #201751), February 17, 2014.
- CH2M HILL, Alamitos Energy Center (13-AFC-01) Data Response Set 1A – Responses to CEC Staff Data Requests 1-8, 10-12, 16-17, 20-25, 38-44, 51-54, and 59-62 (TN #202381), May 27, 2014.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Data Responses, Set 1B (Responses to Data Requests 45 to 47) (TN #202908), August 12, 2014.
- AES Alamitos Energy, LLC, Supplemental Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #206427-1 through 206427-6 and 206428-1 through 206428-3), October 23, 2015.
- Ellison, Schneider & Harris LLP, Alamitos Energy Center (13-AFC-01): Repeated Application for Confidential Designation (TN #206432), October 23, 2015.
- CH2M HILL Engineers, Inc., SAFC Cultural Resources Figure 5.3-1 (TN #206505), November 3, 2015.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Data Responses, Set 6 (Response to Data Requests 83 to 168) (TN #207013), December 14, 2015.
- AES Alamitos Energy, LLC, Alamitos Energy Center (13-AFC-01): Removal of Temporary Secondary Construction Access Road (TN #210632), March 7, 2016.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Preliminary Staff Assessment Initial Comments (TN #212487), July 27, 2016.

D. Submitted With a Request for Confidential Treatment:

- Ellison, Schneider & Harris LLP, AEC Appendix 5.3B Cultural Inventory Report (TN #201725), December 27, 2013.
- Ellison, Schneider & Harris LLP, AEC Appendix 5.3C – 4 Literature Search Results (TN #201729), December 27, 2013.
- Ellison, Schneider & Harris LLP, AEC Appendix 5.3C – 5 Literature Search Results (TN #201730), December 27, 2013.
- Ellison, Schneider & Harris LLP, AEC Appendix 5.3C – 6 Literature Search Results (TN #201731), December 27, 2013.

- Ellison, Schneider & Harris LLP, AEC Appendix 5.3C – 7 Literature Search Results (TN #201732), December 27, 2013.
- Ellison, Schneider & Harris LLP, AEC Appendix 5.3C – 8 Literature Search Results (TN #201733), December 27, 2013.
- Ellison, Schneider & Harris LLP, AEC Appendix 5.3E Full Results Maps (TN #201734), December 27, 2013.
- Ellison, Schneider & Harris LLP, Appendix 5.3C Literature Search Results (TN #206591), October 27, 2015.
- Ellison, Schneider & Harris LLP, Appendix 5.3E Full Results Maps (TN #206590), October 27, 2015.
- Ellison, Schneider & Harris LLP, Appendix 5.3B Cultural Inventory Report (TN #206589), October 27, 2015.

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of my knowledge and belief. To the extent this testimony contains opinions, such opinions reflect my best professional judgment. I make these statements, and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

II. Summary of Testimony

A. Affected Environment

AES will construct, own, and operate the AEC, a natural-gas-fired, air-cooled, combined-cycle and simple-cycle, electrical generating facility in Long Beach, California. The proposed AEC will have a nominal generating capacity of 1,040 MW. The AEC will be constructed on an approximately 21-acre site within the boundaries of the existing AGS property.

AEC will use water provided by the LBWD through existing, onsite water lines. The AEC will include a new, 1,000-foot process/sanitary wastewater pipeline to the first point of interconnection with the existing LBWD sewer system and the elimination of the current practice of treatment and discharge of process/sanitary wastewater to the San Gabriel River. Stormwater runoff from the power block areas will be directed to oil/water separators and to an existing retention basin and then ultimately discharged to the Los Cerritos channel via existing stormwater outfalls.

AEC will interconnect to the existing SCE 230-kV switchyard adjacent to the north side of the AGS. Natural gas will be supplied to the AEC via the existing, offsite, 30-inch-diameter pipeline owned and operated by SoCalGas that currently serves AGS Units 5 and 6. The AEC will require construction of new natural gas-metering facilities and construction of two new natural gas compressor buildings within the AEC footprint.

A cultural resources inventory, which included archival research, architectural reconnaissance, and a surface pedestrian survey, was conducted for the project. The archaeological survey area included the AES site, the existing AGS property, associated linear features, and the 200-foot buffer around the property. The architectural survey area included the AES site, the existing AGS property, the offsite construction/laydown area, and a buffer area of at least one additional parcel deep on all sides of the AGS property, as well as the offsite linear alignment of the process/sanitary wastewater pipeline.

CH2M commissioned a literature search for the AEC from staff of the California Historical Resources Information System (CHRIS) South Central Coastal Information Center (SCCIC), using a definition of a 1-mile buffer zone around the AEC site, laydown areas, and process/sanitary wastewater pipeline corridor. This search radius encompasses the entire research area required by the CEC for archaeological

and architectural surveys. The record search indicated that there are 56 previously recorded properties within one mile of the project site and laydown areas. Of these resources, only one is located within the AEC study area, which is the AGS Fuel Oil Tank Farm. Two of the properties located within the 1-mile radius but outside of the AEC study area are listed on both the California Register of Historical Resources (CRHR) and the National Register of Historic Places (NRHP): the Puvunga Indian Village and the Rancho Los Alamitos, also known as the Bixby House. One additional property located within the 1-mile radius but outside of the AEC study area, the Long Beach Marine Stadium, is listed on the CRHR.

Cultural resources surveys of the AEC study area, laydown areas, tank farm acreage, and offsite process/sanitary wastewater pipeline were conducted on September 28, 2011, July 2, 2012, and April 15, 2015 by CH2M Cultural Resources Specialists. No archaeological resources were observed during the investigations. No areas within the study area were left undisturbed by the construction of the AGS or other modern construction, as described in more detail below. Given the scope of previous ground disturbance in the area, the depth of the artificial fill at the site, historically high groundwater levels, and the proposed depths of the excavations for the AEC, archaeological sensitivity of the surface soils of the AEC study area is considered low.

A cultural resources survey of the built environment of the AEC study area was conducted on September 28, 2011. The survey was inclusive of the AEC site and adjacent parcels, extending no less than one parcel from the AGS property boundaries. All parcels adjacent to the AGS property were reviewed for structures older than 45 years of age or structures that were considered exceptionally significant. Based on the assessor's information, review of historical aerial photographs, and the field survey, only the AGS plant site contained properties that met the above criteria. None of the properties identified as potentially historic appear to meet any of the NRHP or CRHR criteria.

CH2M contacted the Native American Heritage Commission (NAHC) to request information about traditional cultural properties, such as cemeteries and sacred places, in the AEC study area. The NAHC responded with a list of Native Americans interested in consulting on development projects. Each of these individuals/groups was contacted. Prior to the filing of the SAFC, no concerns about the project were expressed to CH2M. In October 2016, Sam Dunlap, acting for Sadonne Goad, Chairperson, of the Gabrielino Tongva Nation, indicated his group has concerns as important sites are known in the area and would confer directly with the CEC in government-to-government consultation. A link to the published FSA was provided to Mr. Dunlap.[5] The NAHC record search of the Sacred Lands file did not indicate the presence of Native American cultural resources in the AEC survey area. The record search conducted at the SCCIC also did not indicate the presence of Native American traditional cultural properties.

CH2M contacted local historical societies within the project area, including the Los Alamitos Museum Association, Historical Society of Long Beach, Long Beach Heritage Coalition, Historical Society of Southern California, Los Angeles County Department of Regional Planning, and City of Long Beach Development Services. The Historical Society of Long Beach website, accessed on August 30, 2011, contains several historical documents, including maps, newspapers, photos, and biographies, but does not contain a listing of historic properties. The City of Long Beach Development Services maintains an online list of historic landmarks and districts for the City of Long Beach and the Historic Preservation Element of the General Plan. One historic property was located within the AEC study area. This property is the Rancho Los Alamitos, which is also recorded with the SCCIC and is located outside of the AEC study area. The City of Long Beach Department of Regional Planning does not maintain a Historic Properties or resources listing. No other responses have been received as of the date of this testimony.

[5] Personal phone call from Sam Dunlap to Natalie Lawson, October 11, 2016.

Previous Site Disturbance

The AEC study area is visible on the 1896 and 1902 Downey, California 30' U.S. Geological Survey (USGS) topographic maps, adjacent to the San Gabriel River and bordered by marshland with several small streams, which connected to Alamitos Bay. Like other rivers in southern California, the San Gabriel River was originally wider and shallower than today and storms sometimes created new channels (San Gabriel River Master Plan). Major flooding occurred in the early 1900's and, as a result of the flooding, the County Board of Engineers was formed in Los Angeles to manage the county's rivers in 1914. Starting in the 1930's, the channelization of the rivers in Los Angeles County began. In the 1950's, the County of Los Angeles and the U.S. Army Corps of Engineers began paving all of the downstream areas of both the Los Angeles and San Gabriel Rivers in concrete, including adjacent to the AEC study area (Stein et al., 2007).[6] This major engineering work resulted in ground disturbance within the project footprint prior to the construction of the AGS.

The AGS was constructed between 1955 and 1969. AGS Units 1 and 2 were completed and began operation in the late 1950s. AGS Units 3 and 4 were completed and began operation in the early 1960s. AGS Units 5, 6, and 7 were completed and began operation in the late 1960s. Appendix C, Figures 1-1 through 1-5 include five aerial photos of the AGS during construction.

Ground disturbance at the AGS was extensive and ongoing throughout the late 1950's and into the 1960's. Previous studies indicate that the AEC study area is underlain by artificial fill, younger dune sand deposits, marsh deposits, and older dune sand deposits. Historic maps indicate that Alamitos Bay and the associated shoreline were very different in 1896. By 1949, historic maps show that levees were constructed, the Marine Stadium was built, and the shoreline of Alamitos Bay looked quite different than it did in 1896. The geotechnical studies indicate that the project was once located in marshland and historic maps show marshland present in the vicinity of the current AGS. Artificial fill was used during construction and the 1964 map shows that most marshland was gone and the AGS is partly constructed. Photos of the ground disturbance, which occurred during the original construction of the plant and during construction of the nearby canal, are also included in Appendix C, Figures 2-1 through 2-8. The photos show extensive disturbance of the native soils. Appendix C, Figure 2-1 shows an excavator and a person at the bottom of a very large excavated area where the sidewalls of the excavation reach above the cab of the excavator. Appendix C, Figures 2-5 through 2-8 show the canal dredging and piles of sediment which resulted from the dredging. Appendix C, Figures 3-1 through 3-5 show the original steam plant and Appendix C, Figures 4-1 through 4-9 show the different phases of the AGS and how the area has changed in the last several decades.

The fuel oil tanks were removed in 2010, causing further disturbance to the AGS property. Due to the extensive disturbance as a result of the construction of the plant, canal dredging, and the removal of the fuel tanks, the possibility of encountering significant buried cultural resources is considered low.

B. Potential Construction Related Impacts; Avoidance and Minimization Measures

Project investigations included archival research; review of all cultural resource investigation reports within the AEC study area; contacts with other interested agencies, Native American groups, and historic societies; and a field survey. These investigations indicated no significant prehistoric or historic archaeological remains, or traditional cultural properties in the AEC study area. Therefore, no impacts on cultural resources are expected.

The literature search and pedestrian survey did not locate any significant prehistoric or historic sites within the AEC site or the existing AGS property.

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[6] Stein, Eric D., Shawna Dark, Travis Longcore, Nicholas Hall, Michael Beland, Robin Grossinger, Jason Casanova, and Martha Sutula. 2007. Historical Ecology and Landscape Change of the San Gabriel River and Floodplain. SCCWRP Technical Report #499. Online Ms., http://greenvisions.usc.edu/documents/SGRreport.pdf. Accessed October 10, 2016.

The literature search and pedestrian survey have shown no significant prehistoric or historic sites located within the AEC study area. One resource was recorded during the survey of the built environment, the AGS Historic District, which is located within the AEC study area. This district, however, is not considered eligible for the CRHR and is not a historical resource.

No areas within the study area were left undisturbed by engineering work done to channelize the San Gabriel River, by the construction of the AGS, the construction of the canals adjacent to the AGS, or by other modern construction. The results of a geotechnical survey indicate the present AGS is constructed on fill, and historically, groundwater in the area is at shallow depths. Although it is possible that excavations could extend beyond the fill into potentially undisturbed deposits below the fill, these areas were at or below the groundwater surface, and intact significant archaeological deposits are considered unlikely. Given the extensive disturbance to the study area from the above described engineering and construction, the previously documented depth of the artificial fill at the site, and the proposed relative depths of the excavations for the AEC, it is anticipated that AEC construction impacts have a low potential to impact buried significant cultural resources that have not previously been disturbed or destroyed.

Although the potential for subsurface construction activities to encounter buried archaeological remains is low, the Applicant has proposed the following mitigation measures to further reduce impacts to cultural resources during construction:

- Designation of a Cultural Resources Specialist (CRS) to investigate any cultural resource finds made during construction.
- Implementation of a construction worker training program.
- Procedures for halting construction in the event that there is an inadvertent discovery of archaeological deposits or human remains.
- Procedures for evaluating an inadvertent archaeological discovery.
- Procedures to mitigate adverse impacts on any inadvertent archaeological discovery determined significant.

C. Potential Operational Related Impacts; Avoidance and Minimization Measures

No ground-disturbing activities are anticipated during AEC operations or maintenance activities; therefore, the AEC would have no operation impacts to cultural resources. Maintenance of AEC facilities will not cause any effects outside the initial construction area of impact. No significant impacts on cultural resources will result from operations or maintenance.

D. Summary of Compliance with Applicable LORS

AEC is expected to comply with the LORS applicable to the project, with incorporation of the mitigation described in the SAFC and the adoption of certain Conditions of Certification proposed in the FSA, as discussed below.

E. Summary of the Potential Cumulative Impacts

As described above, the AEC will not cause any adverse impacts on archaeological or historic resources or traditional cultural properties. The likelihood of encountering buried archaeological resources is extremely low. The project is unlikely, therefore, to have impacts that will combine cumulatively with other closely related past, present, and reasonably foreseeable future projects. With the incorporation of mitigation described in the SAFC, and the adoption of certain Conditions of Certification proposed in the FSA, as discussed below, the project will not contribute to a cumulatively considerable significant impact to cultural resources.

III. Response to Certain Issues Raised in the FSA

The Applicant reiterates that the project site was heavily disturbed prior to the construction of the AGS, as well as during the construction of the AGS and the tank farms. Therefore, the cultural sensitivity of the AEC site is considered low, despite the project's location relative to nearby significant Native American sites where significant and intact cultural resources have been previously identified. The proposed project site has a 21-acre footprint which is located within a greater area of disturbance of approximately 120 acres, related to the construction of the AGS. The AGS itself is located within a 230-acre industrial area along the west bank of the San Gabriel River.[7] Additionally, review of Google Earth and topographic maps, including those listed above and in the archival research section of the SAFC, the nearest recorded archaeological sites with intact significant subsurface deposits are located on the rise of a small hill, at elevations approximately 20 to 30 feet higher than the proposed site.

As a result, full time monitoring by a CRS is not warranted. As such, I am proposing revisions to Condition of Certification CUL-6, as detailed in the following section.

IV. Proposed Licensing Conditions

The FSA proposes eight Conditions of Certification for this subject matter. We agree with the Conditions of Certification for Cultural Resources as proposed in the FSA, except as set forth below.

A. Proposed Revisions to Condition CUL-1

The Applicant's Preliminary Staff Assessment (PSA) comments requested changes to proposed Condition CUL-1 based on the lengthy process of receiving approval of a CRS for another project before the CEC. In the FSA, the cultural staff characterizes the Applicant's requested changes to Condition CUL-1 verification as follows:

*The applicant requests that staff add to condition **CUL-1** a provision guaranteeing automatic approval of a prospective CRS that has served as a CRS on Energy Commission projects within the last 5 years, except under limited circumstances (AES 2016:16).*[8]

In support of its rejection of the proposed changes to Condition CUL-1, the cultural staff provided three reasons for rejecting the proposed Condition CUL-1 verification language, as outlined below:

1. No two projects present identical cultural resources impact potential, even projects in close proximity. Therefore, it is imperative that CRSs be approved with the specific project they will be working on in mind. Past approval of a CRS on one project does not automatically qualify the same CRS for another project that may require different regional knowledge or expertise.
2. Additionally, the qualifications of a CRS may change over time as missing information comes to light or inaccurate information is corrected, whereby a CRS approved several years previously may not be considered qualified subsequently.
3. A conflict of interest may exist preventing a CRS to be approved for this specific project. Lastly, as with any profession, there is the possibility that a CRS that was previously found adequate subsequently engages in compromising job-related conduct that disqualifies them from being considered an adequate candidate for overseeing implementation of project mitigation.

[7] See, Tetra Tech, *California's Coastal Power Plants: Alternative Cooling System Analysis*, Chapter 7A, p. A-4, available at http://www.opc.ca.gov/webmaster/ftp/project_pages/OTC/engineering%20study/Chapter_7A_Alamitos_Generating_Station.pdf.

[8] Alamitos Energy Center Final Staff Assessment, Part 1 (TN #213768), page 4.3-60.

Staff's first rationale for rejecting the Applicant's proposed changes to Condition CUL-1 has no statutory or regulatory basis. The CRS qualifications presented in Condition CUL-1 already require qualifications above and beyond that required in Title 36, Code of Federal Regulations (CFR), Part 61[9]:

1. A background in anthropology, archaeology, history, architectural history, or a related field;
2. At least 10 years of archaeological or historical experience (as appropriate for the project site), with resources mitigation and fieldwork;
3. At least one year of field experience in California; and
4. At least three years of experience in a decision-making capacity on cultural resources projects in California and the appropriate training and experience to knowledgably make recommendations regarding the significance of cultural resources.

Staff's proposed language for Condition CUL-1 requires 10 years of archaeological or historical experience (as appropriate for the project site). In contrast, the U.S. Secretary of the Interior's Professional Qualifications Standards requires at least four months of supervised field and analytic experience in general North American archeology. The minimum standards required by the U.S. Secretary of the Interior's Professional Qualifications Standards are significantly less rigorous regarding local archaeological experience than proposed in Condition CUL-1.

Staff's second reason for rejecting the proposed changes to Condition CUL-1 verification was that the qualifications of a CRS may change over time as missing information comes to light or inaccurate information is corrected, whereby a CRS approved several years previously may not be considered qualified subsequently. The language proposed for incorporation into Condition CUL-1 requires the submittal of a resume demonstrating the proposed CRS's conformance with the qualification requirement. The Applicant agrees that if a previously approved CRS does not meet the qualification requirement of Condition CUL-1, then the person should not be approved. The Applicant's proposed language does not prohibit the Staff from disqualifying someone who does not meet certain requirements. Thus, this reason for rejecting the Applicant's proposed change has no basis.

Finally, Staff suggests that "a conflict of interest may exist preventing a CRS to be approved for this specific project." What constitutes a "conflict of interest" is not explained, nor does Staff provide any clear, objective standards for what may constitute a "conflict of interest" rendering a person unfit for approval. Staff states the possibility that someone previously found qualified "subsequently engages in compromising job-related conduct that disqualifies them from being considered an adequate candidate for overseeing implementation of project mitigation." Again, the type of "compromising job-related conduct" that would disqualify a person is not explained, nor is it clear how a determination that "compromising job-related conduct" occurred will be made by the CPM. It is extremely concerning that these types of subjective determinations, as to what may constitute "compromising job-related conduct," may be used as a basis by which a CPM will disqualify an otherwise qualified individual, potentially interfering with a qualified professional's opportunity to work. It is even more concerning that an otherwise qualified individual has no mechanism with which to dispute an allegation that "compromising job-related conduct" occurred, or to otherwise defend the integrity of that person's work. Such a system is tantamount to creating an underground personnel review board without any sort of procedural or substantive due process protections for the affected person. The law, and good government, demand clear standards and transparency, especially where an individual's life and livelihood are at risk.

[9] It should be noted that the U.S. Secretary of the Interior's Professional Qualifications Standards guidelines in Title 36, CFR, Part 61 require, beyond a graduate degree, at least one year of full-time professional experience or equivalent specialized training in archeological research, administration or management; at least four months of supervised field and analytic experience in general North American archeology; and a demonstrated ability to carry research to completion.

In short, Staff's proposed Condition CUL-1 lacks an objective mechanism by which a CRS is approved and creates the possibility of well-qualified individuals being wrongly prevented from pursuing their chosen profession. The Applicant's proposed changes to the verification for Condition CUL-1 below provide for a provision to reject a proposed CRS based on clear, objective standards, and should be adopted.

> **Verification: The Project Owner shall provide the Compliance Project Manager (CPM) with the resume and qualifications of its Cultural Resource Specialist (CRS) for review and approval. A proposed CRS previously approved by Commission Staff within the preceding five (5) years shall be deemed approved ten (10) days after project owner provides a resume and statement of availability of the proposed CRS.**
>
> **The CPM may propose to disqualify a previously approved CRS within seven (7) days of Project Owner submission of the Proposed CRS' resume and statement of availability only if non-compliance or performance issues events were documented in the compliance record for the previous CEC project or if the CRS's qualifications are not applicable to the specific cultural resources identified in the project area. Any CRS deemed disqualified by the CPM may appeal the proposed disqualification to the Deputy Director of the Siting, Transmission, and Environmental Protection Division, who shall hold an informal meeting with the parties within 10 business days and issue a determination on disqualifications within 20 business days.**

B. Proposed Revisions to Condition CUL-6

As proposed in the FSA, this condition provides for full-time archaeological monitoring under circumstances where such monitoring may not be necessary. The Applicant proposes that the Condition CUL-6 language approved by the Commission in the Final Decision for the Huntington Beach Energy Project be adopted instead, as presented below.

> **CUL-6 Undiscovered Cultural Resources**
>
> **In the event that a CRHR eligible (as determined by the CPM) cultural resource is discovered, at the direction of the CPM, the project owner shall ensure that the CRS or alternate CRS monitors full time all ground disturbances in the area where the CRHR-eligible cultural resources discovery has been made. The level, duration, and spatial extent of monitoring shall be determined by the CPM. In the event that the CRS believes that a current level of monitoring is not appropriate, a letter or e-mail detailing the justification for changing the level of monitoring shall be provided to the CPM for review and approval prior to any change in the level of monitoring.**
>
> **Full-time archaeological monitoring for the project, if deemed necessary due to the discovery of a CRHR-eligible cultural resource, shall consist of archaeological monitoring of all earth-moving activities in the area(s) of discovery(ies), for as long as the CPM requires.**
>
> **The project owner shall obtain the services of one or more NAMs to monitor construction-related ground disturbance in areas, if any, where Native American artifacts have been discovered. Contact lists of interested Native Americans and guidelines for monitoring shall be obtained from the NAHC. Preference in selecting an NAM shall be given to Native Americans with traditional ties to the area that shall be monitored. If efforts to obtain the services of a qualified NAM are unsuccessful, the project owner shall immediately inform the CPM. The CPM will either identify potential monitors or will allow construction-related ground disturbance to proceed without an NAM.**
>
> **If monitoring should be needed, as determined by the CPM, due to the discovery of a CRHR-eligible cultural resource, the CRS shall keep a daily log of any monitoring and other cultural resources activities and any instances of non-compliance with the Conditions and/or applicable LORS on forms provided by the CPM. Copies of the daily monitoring logs shall be**

provided by the CRS to the CPM, if requested by the CPM. From these logs, the CRS shall compile a monthly monitoring summary report to be included in the MCR. If there are no monitoring activities, the summary report shall specify why monitoring has been suspended.

The CRS, at his or her discretion, or at the request of the CPM, may informally discuss cultural resource monitoring and mitigation activities with Energy Commission technical staff. Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS, or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these Conditions.

Upon becoming aware of any incidents of non-compliance with the Conditions and/or applicable LORS, the CRS and/or the project owner shall notify the CPM by telephone or e-mail within 24 hours. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the Conditions. When the issue is resolved, the CRS shall write a report describing the issue, the resolution of the issue, and the effectiveness of the resolution measures. This report shall be provided in the next MCR for the review of the CPM.

The research design in the CRMMP shall govern the collection, treatment, retention/disposal, and curation of any archaeological materials encountered. The daily monitoring logs shall at a minimum include the following:

- **First and last name of the CRM and any accompanying NAM.**
- **Time in and out.**
- **Weather. Specify if weather conditions led to work stoppages.**
- **Work location (project component). Provide specifics – e.g., power block, landscaping.**
- **Proximity to site location. Specify if work conducted within 1000 feet of a known cultural resource.**
- **Work type (machine).**
- **Work crew (company, operator, foreman).**
- **Depth of excavation.**
- **Description of work.**
- **Stratigraphy.**
- **Artifacts, listed with the following identifying features:**
  - **Field artifact #: When recording artifacts in the daily monitoring logs, the CRS shall institute a field numbering system to reduce the likelihood of repeat artifact numbers. A typical numbering system could include a project abbreviation, monitor's initials, and a set of numbers given to that monitor: e.g., AEC-MB-123.**
  - **Description.**
  - **Measurements.**
  - **Universal Transverse Mercator coordinates.**
- **Whether artifacts are likely to be isolates or components of larger resources.**
- **Assessment of significance of any finds.**
- **Actions taken.**

- **Plan for the next work day.**

A cover sheet shall be submitted with each day's monitoring logs, and shall at a minimum include the following:

- **Count and list of first and last names of all CRMs and of all NAMs for that day.**
- **General description (in paragraph form) of that day's overall monitoring efforts, including monitor names and locations.**
- **Any reasons for halting work that day.**
- **Count and list of all artifacts found that day: include artifact #, location (i.e., grading in Unit X), measurements, UTMs, and very brief description (i.e., historic can, granitic biface, quartzite flake).**
- **Whether any artifacts were found out of context (i.e., in fill, caisson drilling, flood debris, spoils pile).**

If requested by the CPM, copies of the daily monitoring logs and cover sheets shall be provided by e-mail from the CRS to the CPM, as follows:

- **Each day's monitoring logs and cover sheet shall be merged into one PDF document.**
- **The PDF title and headings, and e-mails shall clearly indicate the date of the applicable monitoring logs.**
- **PDFs for any revised or resubmitted versions shall use the word "revised" in the title.**

Daily and/or weekly maps shall be submitted along with the monitoring logs as follows:

- **The CRS shall provide daily and/or weekly maps of artifacts at the request of the CPM. A map shall also be provided if artifact locations show complexity, high density, or other unique considerations.**
- **Maps shall include labeled artifacts, project boundaries, previously recorded sites and isolates, aerial imagery background, and appropriate scales.**

The Cultural Resources section of the MCR shall be prepared in coordination with the CRS, and shall include a monthly summary report of cultural resources-related monitoring. The summary shall:

- **List the number of CRMs and NAMs on a daily basis, as well as provide monthly monitoring-day totals.**
- **Give an overview of cultural resource monitoring work for that month, and discuss any issues that arose.**
- **Describe fulfillment of requirements of each cultural mitigation measure.**
- **Summarize the confidential appendix to the MCR, without disclosing any specific confidential details.**
- **Include the artifact concordance table (as discussed under the next bullet point), but with removal of UTMs.**
- **Contain completed DPR 523A forms for all artifacts recorded or collected in that month shall be submitted as one combined PDF that includes an index and bookmarks. For any artifact without a corresponding DPR form, the CRS shall specify why the DPR form is not applicable or pending (i.e. as part of a larger site update). A concordance table that matches field artifact numbers with the artifact numbers used in the DPR forms shall be**

included. The sortable table shall contain each artifact's date of collection and UTM numbers, and not if an artifact has been deaccessioned or otherwise does not have a corresponding DPR form. Any post-field log recordation changes to artifact numbers shall also be noted.

- **If artifacts from a given site location (in close proximity of each other or an existing site) are collected month after month, and if agreed upon with the CPM, a final updated DPR for the site may be submitted at the completion of monitoring. The monthly concordance table shall note that the DPR form for the included artifacts is pending.**

Verification:

1. **At least 30 days prior to the start of ground disturbance, the CPM will provide to the CRS an electronic copy of a form to be used as a daily monitoring log.**
2. **While monitoring is on-going and as required by the CPM, the project owner shall submit each day's monitoring logs and cover sheet merged into one PDF document by e-mail within 24 hours.**
3. **The CRS and/or project owner shall notify the CPM of any incidents of noncompliance with the Conditions and/or applicable LORS by telephone or e-mail within 24 hours.**
4. **If resources are discovered as outlined in this Condition of Certification, the project owner shall notify all local Native American groups of the discovery of the resource within 48 hours of its discovery. If resources are discovered as outlined in this Condition of Certification, the project owner shall appoint one or more NAMs. Within 15 days of receiving from a local Native American group a request that a NAM be employed, the project owner shall submit a copy of the request and a copy of a response letter to the CPM. The project owner shall include a copy of this Condition of Certification in any response letter.**
5. **While monitoring is on-going, the project owner shall include in each MCR a copy of the monthly summary of cultural resources related monitoring prepared by the CRS and shall attach any new DPR 523A forms completed for finds treated prescriptively, as specified in the CRMMP.**
6. **Final updated DPRs with sites (where artifacts are collected month after month) can be submitted at the completion of monitoring, as agreed upon with the CPM.**
7. **At least 24 hours prior to implementing a proposed change in monitoring level, the project owner shall submit to the CPM, for review and approval, a letter or e-mail detailing the CRS's justification for changing the monitoring level.**

Within 15 days of receiving them, the project owner shall submit to the CPM copies of any comments or information provided by Native Americans in response to the project owner's transmittals of information.

Geological Hazards and Resources

I. Introduction

A. Name: Thomas A. Lae

B. Qualifications: The panel's qualifications are as noted in their resumes contained in Appendix A.

C. Prior Filings: In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- AES Southland Development, LLC, Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #201620-1 through #201620-72), December 27, 2013.
- AES Alamitos Energy, LLC, Supplemental Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #206427-1 through 206427-6 and 206428-1 through 206428-3), October 23, 2015.
- AES Alamitos Energy, LLC, Alamitos Energy Center (13-AFC-01): Removal of Temporary Secondary Construction Access Road (TN #210632), March 7, 2016.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Preliminary Staff Assessment Initial Comments (TN #212487), July 27, 2016.

The facts contained in this testimony (including all referenced documents) are true and correct to the best of my knowledge and belief. To the extent this testimony contains opinions, such opinions reflect my best professional judgment. I make these statements, and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

II. Summary of Testimony

A. Affected Environment

The AEC site is a 21-acre site within a larger 71.1-acre parcel located along the San Gabriel River drainage on a gently sloping coastal plain northeast of Alamitos Bay in the southeast part of the City of Long Beach. The AEC site is situated in the Los Angeles Basin at the northwest end of the Peninsular Ranges geomorphic province of southern California and is underlain by artificial fill and paralic and alluvial fan deposits.

The project site is located within a seismically active region influenced by blind thrust faults, such as the San Joaquin Hills, Puente Hills, and Upper Elysian Park. Although these blind thrust faults are not mapped, they can be capable of generating damaging earthquakes and could influence seismic design at the site. The project site is not transected by known active or potentially active faults. Thus, the potential for surface fault rupture affecting the project is relatively low.

The variable depth to groundwater observed near the project site may require groundwater management during project-related excavations and construction activities. The project site is located in a State of California Tsunami Inundation Area mapped for susceptibility to tsunami inundation or a tsunami run-up hazard. The project site is also located in an area subject to flooding from a failure of the Whittier Narrows Dam or the Prado Dam, but the potential for inundation due to dam failure is considered low because of the regulatory monitoring of dams, nearby drainage channels, and the site distances from these dams.

There are no known geologic resources of recreational, commercial, or scientific value at the project site or in the project vicinity. There are no oil, gas, or geothermal wells or sand/gravel quarries at or near the AEC site.

B. Potential Construction and Operational Related Impacts; Avoidance and Minimization Measures

There is potential for seismic ground shaking to affect the project site in the event of a large-magnitude earthquake occurring on fault segments located near the project. The AEC, however, is not located within a State of California Earthquake Fault Zone or within the trace of any known active fault. The project would, therefore, not be likely to cause direct human exposure to ground rupture. Seismic hazards and potential adverse foundation conditions (liquefaction, expansive soils, and compressive soils) will be minimized by conformance with the recommended seismic design criteria of the 2013 California Building Code (CBC).

The near-term impacts associated with groundwater are anticipated to involve construction excavations and possible below-grade structures. Excavations that extend below groundwater would involve construction dewatering to maintain excavations in a relatively dry condition. Below-grade structures that extend below groundwater, including pipelines, vaults, and retention basins, would be designed to resist hydrostatic uplift pressures from groundwater and would involve waterproofing, as appropriate. Long-term groundwater impacts may involve rising groundwater levels associated with predicted sea level rises.

Measures to minimize the risk of tsunami run-up hazards will include structural and civil engineering evaluation, strengthening of seafront structures, and emergency warning systems such as the seismic Sea-Wave Warning System for the Pacific Ocean operated by a cooperative program of nations around the Pacific Rim and the Alaska Tsunami Warning Center operated by the National Weather Service. Structural reinforcements, as required by the CBC, are part of the AEC design. These measures will reduce the exposure of people to the risks of tsunami run-up hazards to less-than-significant levels.

The findings of geotechnical explorations at the site indicate that the probability of mass wasting, subsidence, and flooding by dam failure occurring at the project site is low to negligible.

The project structures and equipment will be designed in accordance with the 2013 CBC seismic requirements to withstand the ground motion of a design basis earthquake. Compliance with the 2013 CBC seismic requirements will minimize the exposure of people to the risks associated with large seismic events.

Based on the analysis presented, the project will have no effect on oil and gas production or on other geologic resources of commercial value or on the availability of such resources.

A geotechnical engineer will be assigned to the project to carry out the duties required to assess geologic conditions during construction and approve actual mitigation measures used to protect the facility from geologic hazards. With the implementation of mitigation measures, the AEC will not result in significant direct, indirect, or cumulative geology-related impacts.

C. Summary of Compliance with Applicable LORS

AEC is expected to comply with the LORS applicable to the project.

D. Summary of the Potential Cumulative Impacts

AEC will not cause any adverse impacts on geological resources and will not cause an exposure of people or property to geological hazards. There are no minor impacts that could combine cumulatively with those of other projects.

III. Response to Certain Issues Raised in the FSA

The PSA proposed a condition requiring preparation of a "Tsunami Protection Plan." AES's comments on the PSA stated that, while there is no legal or regulatory requirement to prepare a Tsunami Protection Plan, the Applicant would not object to incorporating tsunami hazard notification and evacuation plans into the Emergency Action Plan for construction and operation. The Applicant pointed to the existing Emergency Action Plan that is in place at the AGS, which addresses tsunami hazards and measures to inform employees and contractors of the potential hazard. The project will be designed to minimize and avoid potential risks from tsunami run-up hazards.

The FSA acknowledges that there is no regulatory requirement for preparation of the Tsunami Protection Plan, but still proposes adoption of the requirements of Condition GEO-2, stating that "the hazard to public health and safety from tsunami inundation is significant and requires mitigation." The evidence indicates that, while there is a potential risk of tsunami inundation, the probability of a tsunami event is low. The project's design features will help minimize the effects of a tsunami. Furthermore, the Emergency Action Plans that will be put into place for the AEC for both construction and operation in accordance with Conditions WORKER SAFETY-1 and WORKER SAFETY-2 will address tsunami hazards and measures to inform employees and contractors of the potential hazards. Therefore, Condition GEO-2 is not required to mitigate a significant impact, as measures are already in place to minimize potential impacts.

Not only is Condition GEO-2 unnecessary, but the language of the condition is onerous and contains requirements that should not be applied to a private entity. Condition GEO-2 would require that the Tsunami Preparation Plan "complies with the recommendations and procedures provided in the 2006 Tsunami Annex to the Los Angeles County Emergency Response Plan (LACOA, 2006)[10] and any of its successors." However, the 2006 Tsunami Annex was written to guide County departments, agencies, cities, districts, and other governmental jurisdictions and to coordinate multi-agency, multi-disciplinary approaches to respond to a tsunami threat or event. The 2006 Tsunami Annex does not contain "recommendations and procedures" applicable to private entities.

Condition GEO-2 also requires that the Tsunami Protection Plan be updated "at least" twice a year, in addition to whenever the County's All-Hazard Mitigation Plan is updated. This degree of update and review is neither appropriate nor necessary to address potential tsunami risk, which is characterized in the staff assessment as "While not likely to occur during the project design life, the site is subject to inundation by Tsunami".[11] Even the 2006 Tsunami Annex to the Los Angeles County Emergency Response Plan referenced in the FSA is subject to review every three years. The All-Hazard Mitigation Plan is reviewed every five years.

Condition GEO-2 would require that every visitor to the AEC site be subject to a training program for how to respond to tsunami hazards. By its express terms, this language would require extensive training and documentation for a wide array of people that may happen to "visit" the AEC site, including package delivery people or other occasional visitors whose visit to the site could be for a shorter period of time than would be required for the mandatory training. There is no justification in the PSA or elsewhere in the record for such a burdensome "training" requirement.

In short, the extensive requirements set forth in Condition GEO-2 are simply not needed. Condition GEO-2 should not be adopted.

[10] LACOA. 2006. Tsunami Annex to the Los Angeles County Emergency Response Plan, March. Lacoa.org/pdf/tsunami%20annex.pdf.

[11] Alamitos Energy Center Final Staff Assessment (TN #213768), page 1-9.

IV. Proposed Licensing Conditions

The Applicant agrees with Condition of Certification GEO-1 as proposed in the FSA. The Applicant objects to Condition of Certification GEO-2 as proposed in the FSA, and recommends that this Condition not be adopted.

Hazardous Materials Handling

I. Introduction

A. Name: Jerry Salamy

B. Qualifications: The panel's qualifications are as noted in their resumes contained in Appendix A.

C. Prior Filings: In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- CH2M HILL, Alamitos Energy Center (13-AFC-01) Data Response Set 1A – Responses to CEC Staff Data Requests 1-8, 10-12, 16-17, 20-25, 38-44, 51-54, and 59-62 (TN #202381), May 27, 2014.
- AES Alamitos Energy, LLC, Supplemental Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #206427-1 through 206427-6 and 206428-1 through 206428-3), October 23, 2015.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Data Responses, Set 6 (Response to Data Requests 83 to 168) (TN #207013), December 14, 2015.
- AES Alamitos Energy, LLC, Alamitos Energy Center (13-AFC-01): Removal of Temporary Secondary Construction Access Road (TN #210632), March 7, 2016.
- California Energy Commission, Report of Conversation: Alamitos Siting-related Visit for Hazardous Materials/Worker Safety (TN #212030), April 20, 2016.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Preliminary Staff Assessment Initial Comments (TN #212487), July 27, 2016.

The facts contained in this testimony (including all referenced documents) are true and correct to the best of my knowledge and belief. To the extent this testimony contains opinions, such opinions reflect my best professional judgment. I make these statements, and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

II. Summary of Testimony

A. Affected Environment

The proposed AEC will be constructed on an approximately 21-acre site within the larger 71.1-acre property of the existing AGS. This site is located in an industrial-zoned area within Long Beach, California. Access to the AEC site will be provided via an existing entrance off North Studebaker Road, just north of the intersection of Westminster Avenue and North Studebaker Road.

Land use in the vicinity of the AEC site is a mix of industrial, commercial, residential, and recreational development. The AEC site is bounded to the north by the existing AGS, SCE switchyard, and SR 22 (East 7th Street); to the east by the San Gabriel River and, beyond that, the LADWP's Haynes Generating Station; to the south by the Plains West Coast Terminals petroleum storage facility and undeveloped property; and to the west by the Los Cerritos channel.

The AEC will use hazardous materials during project construction, demolition of the remaining AGS Unit 7 components (hereinafter described as "demolition"), and operation activities. Hazardous materials are required for emissions control and facility operation and maintenance, such as lubrication of equipment and treatment and laboratory analyses of process and closed-loop cooling water, or will be contained within transformers and electrical switches. Many of these hazardous materials are also used at the existing AGS. The project will comply with applicable laws and regulations for the storage of these

materials to minimize the potential for a release of hazardous materials and will conduct emergency response planning to address public health concerns regarding hazardous materials storage and use.

B. Potential Construction Related Impacts; Avoidance and Minimization Measures

Hazardous materials to be used during AEC construction and demolition of the remaining components of AGS Unit 7 equipment and facilities located within the site footprint of the AEC will include gasoline, diesel fuel, motor oil, hydraulic fluid, solvents, cleaners, sealants, welding flux, lubricants, paint, and paint thinner. There are no feasible alternatives to vehicle fuels and oils for operating construction equipment. The types of paint required are dictated by the types of equipment and structures that must be coated and by the service conditions and environment.

The quantities of hazardous materials that will be onsite during construction and demolition are relatively small and BMPs will be implemented by contractor personnel. Therefore, the potential for environmental effects is expected to be small.

Construction will involve the transport of limited quantities of hazardous materials to the AEC site and will pose minor hazards associated with their use. Small fuel spills may also occur during onsite refueling. The potential environmental effects from fueling operations are expected to be limited to small areas of contaminated soil. If a fuel spill occurs on soil, the contaminated soil will be placed into barrels or trucks for offsite disposal as a hazardous waste.

Mitigation Measures

During the construction phase, the following control measures will be followed: use of BMPs to reduce the potential for the release of construction/demolition-related fuels and other hazardous materials to stormwater and receiving waters; construction/demolition service personnel will follow general industry health, safety, and environmental BMPs for filling and servicing construction/demolition equipment and vehicles; should a spill contaminate soil, the soil will be put in containers and disposed of as appropriate; all containers used to store hazardous materials will be inspected at least once per week for signs of leaking or failure; all maintenance and refueling areas will be inspected monthly; and results of inspections will be recorded in a logbook that will be maintained onsite.

Small spills will be contained and cleaned up immediately by trained, onsite personnel. Large spills will be reported via emergency phone numbers to obtain help from offsite containment and cleanup crews. If a spill involves hazardous materials quantities equal to or greater than the specific Reportable Quantities (RQ) (42 gallons for petroleum products), all federal, state, and local reporting requirements will be followed. In the event of a fire or injury, the local fire department will be called.

All personnel working on the project during construction and demolition will be trained in handling hazardous materials and the dangers associated with hazardous materials. An onsite health and safety person will be designated to implement health and safety guidelines and to contact emergency response personnel and the local hospital, if necessary.

C. Potential Operational Related Impacts; Avoidance and Minimization Measures

Most of the hazardous substances that will be used by the project are required for treatment and laboratory analyses of process and closed-loop cooling water, facility maintenance, and lubrication of equipment, or will be contained within transformers and electrical switches. The only regulated substance that will be used for the project is 19-percent aqueous ammonia, which will be used for emissions control.

Two horizontal aboveground storage tanks will be installed at the AEC facility to store aqueous ammonia solution: a 40,000-gallon tank for the AEC CCGT and a 30,000-gallon tank for the AEC SCGT. Each of the ammonia storage tanks will be surrounded by a covered secondary containment structure capable of holding the full contents of the tank, plus rainwater. Each truck unloading area will include a concrete

pad, sloped to drain spillage to the storage tank containment sump. Approximately six times per month (or approximately 72 deliveries per year), one 7,000-gallon tanker truck will deliver aqueous ammonia to the site.

Storage and use of ammonia are subject to the requirements of the California Fire Code, Article 80, as well as the California Accidental Release Prevention (CalARP) program. Article 80 of the California Fire Code contains specific requirements for control of liquid and gaseous releases of hazardous materials. Secondary containment in the form of spill containment vaults will be provided for the ammonia storage tanks and loading areas. Additionally, the facility will be required to prepare a Risk Management Plan (RMP) in accordance with the CalARP program, further specifying safe handling procedures for the ammonia, as well as emergency response procedures in the event of an accidental release. The RMP will be prepared for the site prior to operation of the AEC.

Because of its hazardous properties, ammonia is classified as a regulated substance, and an accidental release of the aqueous ammonia solution could present a human health hazard. If the aqueous ammonia solution leaks or is released without proper controls, the ammonia in solution could escape or evaporate as a gas into the atmosphere. The results of the offsite consequence analysis for the worst-case release scenario of 19-percent aqueous ammonia at the AEC indicate that there will be no exceedances of the toxic endpoints beyond the project fenceline and, with the implementation of engineering controls (secondary containment designs) and compliance with applicable regulatory requirements, no significant impacts associated with the storage and use of aqueous ammonia is expected.

Materials will be handled in accordance with a Hazardous Materials Business Plan (HMBP) approved by the Long Beach Environmental Health Bureau and the CEC. With proper storage and handling of flammable materials in accordance with the California Fire Code and the site-specific HMBP, the risk of fire and explosion at the generating facility will be minimal.

Project operation will require regular transportation of hazardous materials to the project site. Transportation of hazardous materials will comply with all California Department of Transportation (Caltrans), U.S. Environmental Protection Agency (EPA), California Department of Toxic Substances Control (DTSC), California Highway Patrol (CHP), and California State Fire Marshal regulations. Aqueous ammonia, a regulated substance, will be delivered to the facility and transported in accordance with California Vehicle Code (CVC) Section 32100.5, which regulates the transportation of hazardous materials that pose an inhalation hazard. Ammonia will only be transported along approved transportation routes. The proposed transportation route for hazardous materials used at the AEC will pass near the Rosie the Riveter Charter High School, but not directly, and only when the trucks are on the AEC property.

The natural gas fuel the facility will use is flammable and could leak from the existing SoCalGas pipeline that brings gas onsite. Natural gas is composed mostly of methane, but also may contain ethane, propane, nitrogen, butane, isobutene, and isopentane. It is colorless, odorless, tasteless, and lighter than air. Pipeline natural gas contains an added odorant so leaks or releases can be detected. At concentrations of 5 to 14 percent, methane is flammable and can detonate. Natural gas, therefore, poses a risk of fire and explosion if an accidental release occurs. However, the risk of a fire or explosion will be reduced through compliance with applicable codes, regulations, and industry design/construction standards. The existing SoCalGas natural gas supply pipeline to the AEC site is designed to meet a Class 3 service and meet the California Public Utilities Commission (CPUC) General Order 112-D and 58-A standards, in addition to the federal requirements for gas pipeline construction and safety.

Mitigation Measures

All hazardous materials and one regulated substance, aqueous ammonia, stored onsite during AEC operation will be handled and stored in accordance with applicable codes and regulations. In accordance with the CalARP program regulations, an RMP will be prepared for the aqueous ammonia storage tanks and will include a hazard assessment to evaluate the potential effects of an accidental release, a program for preventing accidental release, and a program for responding to an accidental release to protect human health and the environment. A Spill Prevention Control and Countermeasure (SPCC) plan will also be prepared for the AEC.

Transportation will comply with the applicable regulations for transporting hazardous materials, including Caltrans, EPA, DTSC, CHP, and California State Fire Marshal regulations.

An HMBP will be prepared in accordance with the Health and Safety Code (Section 25504) to include an inventory and location map of hazardous materials onsite and an emergency response plan for hazardous materials incidents. In accordance with emergency response procedures specified in the HMBP, designated personnel will be trained as members of a plant hazardous materials response team, and team members will receive the first responder and hazardous materials technical training to be developed in the HMBP, including training in appropriate methods to mitigate and control accidental spills. In the event of a chemical emergency, plant personnel will defer to the City of Long Beach Fire Department.

City of Long Beach Fire Department Station No. 22 is approximately 2 miles away from the AEC site and will provide first response, with an approximate 5-minute response time on average. City of Long Beach Fire Department firefighters and stations are certified and capable of managing a hazardous materials-related incident. Additionally, City of Long Beach Fire Department Stations No. 24 and 19 house specialized equipment and personnel for hazardous materials response, and these resources can be deployed city-wide when requested. If needed, the City of Long Beach Fire Department has mutual aid and automatic aid agreements for additional response from the Los Angeles County Fire Department and the Orange County Fire Authority. The most likely scenario for use of mutual aid to the AEC site will come from Orange County Fire Authority resources at Orange County Stations No. 48, 17, and 42.

In accordance with applicable federal, state, and local regulations, site personnel will regularly inspect all hazardous materials handling facilities for compliance with applicable regulations and will ensure that any deficiencies are promptly repaired. Additionally, the facility could be subject to periodic inspections by the Long Beach Environmental Health Bureau and the City of Long Beach Fire Department, which will monitor for compliance with appropriate regulatory requirements for hazardous materials and regulated substances handling.

D. Summary of Compliance with Applicable LORS

AEC is expected to comply with the LORS applicable to the project.

E. Summary of the Potential Cumulative Impacts

The offsite consequence analysis determined that the risk posed to the local community from the storage of aqueous ammonia at the AEC is not significant, given that ammonia concentrations above the "benchmark" thresholds would not be accessible to the public in the event of a catastrophic release. Additionally, existing laws and regulations address the handling, transportation, and use of hazardous materials, including aqueous ammonia, and will ensure that all hazardous materials at the AEC are safely managed. Projects that could result in a cumulative impact will also be required to comply with federal, state, and local LORS. The AEC is unlikely, therefore, to result in cumulative impacts from hazardous materials in combination with other closely related past, present, and reasonably foreseeable future projects.

III. Response to Certain Issues Raised in the FSA

No comments on the FSA.

IV. Proposed Licensing Conditions

The Applicant agrees with the Conditions of Certification for Hazardous Materials Management (HAZ-1 through HAZ-10) set forth in the FSA.

Land Use

I. Introduction

A. Name: Aarty Joshi and Cindy Salazar

B. Qualifications: The panel's qualifications are as noted in their resumes contained in Appendix A.

C. Prior Filings: In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Data Responses, Set 2 (Responses to Data Requests 64 to 68) (TN #202867), August 1, 2014.
- AES Alamitos Energy, LLC, Supplemental Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #206427-1 through 206427-6 and 206428-1 through 206428-3), October 23, 2015.
- Memorandum of Understanding between AES Alamitos, LLC and City of Long Beach (TN #206920), November 16, 2015.
- AES Alamitos Energy, LLC, Alamitos Energy Center (13-AFC-01): Removal of Temporary Secondary Construction Access Road (TN #210632), March 7, 2016.
- City of Long Beach Department of Development Services, Re: SAFC 13-AFC-01 Alamitos Generating Station, City of Long Beach (TN #211504), May 12, 2016.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Preliminary Staff Assessment Initial Comments (TN #212487), July 27, 2016.
- Ellison, Schneider & Harris LLP, AES Alamitos Energy, LLC's Response to Committee's Questions Regarding the Land Use Section of Alamitos Energy Center (AEC) Preliminary Staff Assessment (13-AFC-01) (TN #213749), September 21, 2016.

The facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgment. We make these statements, and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

II. Summary of Testimony

A. Affected Environment

The AEC site and proposed offsite process/sanitary wastewater pipeline are located within the City of Long Beach General Plan Land Use Designation (LUD) No. 7 (Mixed Use). In addition, the AEC site, laydown areas, and proposed offsite pipeline are within the City of Long Beach South East Area Development and Improvement Plan (SEADIP) Specific Plan area of the General Plan. A portion of the AEC CCGT, the 10-acre southern laydown area, and a portion of the proposed wastewater pipeline alignment are within the coastal zone subject to the Local Coastal Program (LCP).

The SEADIP is designated as Planned Development (PD)-1, which is also the zoning district for this area. The AEC site and laydown areas are located within Subarea 19 of the SEADIP and are designated for industrial use. Power generating facilities are a permitted use within the SEADIP PD-1 Industrial use designation. The AEC will conform to the zoning requirements because the project will be implemented on lands already designated, zoned, and currently used for industrial uses.

The City of Long Beach is in the process of updating its General Plan (General Plan 2030), including updates to the SEADIP Specific Plan. In keeping with current land use designations, the proposed land use plan designates the AEC site within the Southeast/SEADIP Neighborhood as Economic Engine – Industrial (I) place type.

B. Potential Construction Related Impacts; Avoidance and Minimization Measures

To determine whether there was a potentially significant impact to land use from the project, I examined the criteria set forth in Appendix G of the California Environmental Quality Act (CEQA) Guidelines as described below.

Divide an Established Community. The existing generating facilities do not physically divide an established community. The 21-acre AEC site will be located within the larger 71.1-acre AGS parcel. The existing facility is immediately surrounded by industrial uses. The land is designated for industrial uses under the SEADIP and proposed update to the SEADIP. The proposed project – construction of a new power plant on land designated for industrials uses and adjacent to land currently used for electricity generation – is not a change in use of the property. Furthermore, the proposed project will not divide an established community, affect access to the City or the project area, or introduce incompatible land uses to the area. In addition, the proposed project will not displace existing non-industrial development or result in new development that would physically divide an existing neighborhood; therefore, potential significant impacts would not occur.

Consistency with an Applicable Land Use Plan, Policy, or Regulation. The AEC site is identified for industrial use, will be constructed within the property boundaries of an existing power plant, has an existing base of industrial uses, and is immediately surrounded by other industrial facilities. Use of the 10-acre adjacent land for laydown during construction will be temporary and is an allowable use under the City's General Industrial (IG) zone. Therefore, the AEC laydown area is consistent with the intent of the PD-1 IG zone.

The proposed offsite process/sanitary wastewater pipeline crosses through an area designated as an overlook area and connects to an existing LBWD sanitary line within an area designated for residential use. As the proposed pipeline will be subsurface (with the exception of a portion that crosses over the Los Cerritos channel), no changes to the land use or zoning in these areas is proposed and no conflict with the land use or zoning for this area would occur. While the existing sanitary line extends through areas designated for residential and golf course uses, it is an existing line and no changes to the use in these areas is proposed. Therefore, the AEC is consistent with applicable City plans, policies, and regulations.

Because implementation of the AEC does not conflict with any applicable land use plan, policy, or regulation, there are no environmental impacts related to land use.

Conflict with an Applicable Habitat Conservation Plan. The AEC site is not located within the limits of any adopted Habitat Conservation Plan or Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan; thus, there will be no impact.

Convert Farmland to Nonagricultural Uses. The project does not involve the conversion of prime farmland, unique farmland, or farmland of statewide importance. Due to extensive development, Long Beach is not currently mapped by the Farmland Mapping and Monitoring Program (FMMP). Therefore, the AEC site, laydown areas, and proposed offsite wastewater pipeline do not have an FMMP designation. No impacts to agricultural resources would occur as a result of implementation of the project.

Cause Changes that Would Result in the Conversion of Farmland. The project site is not in agricultural use nor is it located on designated farmland. Therefore, the project will not cause changes to the existing environment that could result in conversion of farmland to nonagricultural use.

C. Potential Operational Related Impacts; Avoidance and Minimization Measures

Consistency with an Applicable Land Use Plan, Policy, or Regulation. The AEC site, offsite laydown areas, and offsite process/sanitary wastewater pipeline have a General Plan and LCP use designation of No. 7 (Mixed Use). Land use controls and design and development standards for the project area in the No. 7 (Mixed Use) district are directed by the SEADIP (of the City of Long Beach General Plan and LCP). In addition, the AEC site, laydown areas, and proposed wastewater pipeline alignment are zoned as SEADIP PD-1. Therefore, SEADIP provides both the land use and zoning designation for the site.

The AEC site and offsite laydown areas are located in Subarea 19 of the SEADIP and designated for industrial use consistent with the City's IG zone. The proposed wastewater pipeline crosses Subareas 24, 9, and 22(b) of the SEADIP. Subarea 9 is fully developed with residential uses; Subarea 22(b) is a golf course open to the general public; and Subarea 24 "South" is an overlook area and interpretive center for the bordering marsh.

The purpose of the IG district was established to support development of heavy industrial uses:

"The General Industrial (IG) district is considered the City's 'industrial sanctuary' district where a wide range of industries that may not be desirable in other districts may locate. The emphasis is on traditionally heavy industrial and manufacturing uses. The IG district is intended to promote an 'industrial sanctuary' where land is preserved for industry and manufacturing, and where existing industries are protected from non-industrial users that may object to the operating characteristics of industry." (Long Beach Zoning Ordinance, Section 21.33.020.C).

In addition, development standards provided in Chapter 21.37, Planned Development Districts, of the City's Zoning Regulations state:

"Development plans approved by the City Council shall serve as the applicable zoning regulations for a PD zone. Whenever a PD zone does not contain any standards for a particular aspect of development such as landscaping, then the development standards for that aspect of a zoning district which is closest to the overall intent of the particular planned development district shall apply."

Further, Chapter 21.33, Industrial Districts, states:

"In recognition of the fact that industrial and manufacturing technologies change over time, the City has structured these regulations to address the operating characteristics and processes of industrial uses, rather than specific businesses."

Use of land within the IG zone for power generating facilities such as the AEC is a use consistent with these City LORS.

D. Summary of Compliance with Applicable LORS

This section lists and discusses the land use LORS that apply to the AEC. All plans and policies applicable to the 1-mile area surrounding the AEC site and offsite laydown area, as well as the 0.25-mile are surrounding the proposed offsite process/sanitary wastewater pipeline, are summarized below. General Plan and Zoning land use designations for the City of Seal Beach and the Community of Rossmoor within the study area have been included, although these LORS are not applicable to the AEC because the project site, including all project components (plant site, natural gas, and water lines, switchyard, and the transmission lines), and the laydown areas are located within the City of Long Beach.

State LORS

Warren-Alquist Act. Public Resources Code (PRC) Section 25500 of the Warren-Alquist Act provides that the CEC "Shall have the exclusive power to certify all sites and related facilities in the state." Thus, the CEC has exclusive jurisdiction over the permitting of the AEC. The authority of the CEC is "in lieu of any

permit, certificate, or similar document required by any state, local or regional agency… and shall supersede any applicable statute, ordinance, or regulation of any state, local, or regional agency…"

The CEC's certification process is a certified regulatory program pursuant to the CEQA, and is codified in the California PRC Sections 21000 through 21178.1. As noted previously, the CEC's permitting process under the Warren-Alquist Act also preempts the issuance of a Coastal Development Permit (CDP) by the City of Long Beach. This AEC conforms to the requirements of the Warren-Alquist Act and CEQA.

California Coastal Commission, Coastal Act. The California Coastal Commission (CCC) was established by voter initiative in 1972 (Proposition 20) and later made permanent by the Legislature through adoption of the California Coastal Act of 1976 (Coastal Act). Coastal Act, PRC 30000 et seq., establishes a comprehensive scheme to govern land use planning along the entire California coast. The coastal zone varies in width from several hundred feet in highly urbanized areas up to five miles in certain rural areas, and offshore the coastal zone includes a 3-mile-wide band of ocean. The CCC, in partnership with coastal cities and counties, plans and regulates the use of land and water in the coastal zone. But for the CEC process, that supersedes CCC permitting requirements, development activities in the coastal zone generally require a CDP from either the CCC or the local government. The CCC has indicated that it will not be commenting on the AEC, or otherwise participate in this proceeding.

The Coastal Act also provides that "[c]oastal-dependent industrial facilities shall be encouraged to locate or expand within existing sites and shall be permitted as reasonable long-term growth where consistent with [the Coastal Act]" (PRC Section 30260). Section 30264 of the Coastal Act states that "new or expanded thermal electric generating plants may be constructed in the coastal zone if the proposed coastal site has been determined by the [CEC] to have greater relative merit…than available alternative sites and related facilities for an applicant's service area" (PRC Section 30264). The existing AGS property is designated for industrial use (within the SEADIP) and has been previously developed in its entirety for industrial uses. Construction of the AEC at the location of an existing power plant is consistent with these provisions of the Coastal Act, as there are no available alternative sites, and an existing, industrial brownfield site for the AEC is appropriate.

The proposed offsite adjoining 10-acre laydown area is currently vacant and also designated for industrial use (within the SEADIP). The laydown area would be used to support construction activities at the AEC site and, therefore, its use would be temporary. The proposed offsite process/sanitary wastewater pipeline is located largely outside of the coastal zone. The segment of the pipeline that extends into the coastal zone starts at the commencement of the line at the west side of the AEC site, travels south to the intersection with Loynes Drive, then turns west and crosses over the Los Cerritos channel (affixed to the bridge). After crossing the channel, the pipeline heads north on East Vista Street, exiting the coastal zone to connect to the LBWD's existing sanitary system in the residential subdivision. These uses are consistent with the Coastal Act.

California Land Conservation Act (Williamson Act). The California Land Conservation Act of 1965, commonly known as the Williamson Act, was enacted to encourage preservation of agricultural lands and encourage open space preservation and efficient urban growth. The Williamson Act provides incentives to landowners through reduced property taxes to create an agricultural preserve and agree to keep their land in agricultural production (or another compatible use) for at least 10 years. Maps, statistics, and reports on Williamson Act lands are available online. Neither the project site nor wastewater pipeline route is subject to a Williamson Act contract.

Local LORS

Land use provisions that are included in every California city and county General Plan (California State Planning Law, Government Code Section 65302 et seq.) reflect the goals and policies that guide the physical development of land in their jurisdiction. City zoning ordinances are enforced by their respective planning and building departments. The project site, including all project components (plant

site, natural gas and water lines, switchyard, wastewater pipeline, and the transmission lines), are located in the City of Long Beach. The AEC is consistent with all applicable local LORS. The City has expressed support for the AEC, has not identified any concerns with approving the AEC, and has not identified any local LORS noncompliance issues.

E. Summary of the Potential Cumulative Impacts

Cumulative land use impacts could occur if the development of a proposed project and other related past, present, and reasonably foreseeable probable future projects would be inconsistent with applicable plans and policies, or have other cumulative land use related impacts.

The City of Long Beach Development Services Department has identified three projects for consideration in the cumulative impacts analysis. The AES BESS was not identified during discussions with the City's development services department.

1. PCH & 2nd Project, 6400 E. Pacific Coast Highway: commercial development to replace existing Seaport Marina Hotel, 10.93-acre site located at the southwest corner of PCH and 2nd Street. Project proposal is for 150,000 square feet of first floor retail space, 73,000 square feet of second floor retail space, and 29,000 square feet of second floor restaurant space, with a three-story enclosed parking structure. The Project Owner has completed Conceptual Site Plan Review and has applied for full Site Plan Review and an Environmental Impact Report (currently in the early data collection stage).
2. Lyon Communities Project, 6701 E. Pacific Coast Highway: Vacant 7.01-acre site located at the southeast corner of PCH and Studebaker Road (site is commonly known as the Pumpkin Patch). Project proposal is for two one-story restaurant buildings fronting PCH, each at 10,000 square feet, with a 4,327 square foot bank building and three-level, 67-room hotel located on the eastern portion of this site, along with 293 surface parking spaces. The project is currently in the Conceptual Site Plan Review stage.
3. Wetlands Mitigation Bank: Submission of formal application with the City is pending. Project consists of Synergy, Pumpkin Patch, and Studebaker/Loynes sites. Proposed activities are to establish a mitigation bank on the northerly approximately 76 acres of the 156-acre Synergy Oil Field, implement a wetlands habitat restoration plan, construct public access improvements including trails, parking, and a visitors center. In addition, proposed activities involve removal and consolidation of oil extraction operations on Synergy site and shift production activities offsite (in a proposed land exchange agreement) from the Los Cerritos Wetland Authority (LCWA) site.

Not identified by the City of Long Beach development services department is the AES Energy Storage BESS project. AES Energy Storage is in the development phase for a 300 MW BESS project on the AGS property and the City of Long Beach has completed an Initial Study and Mitigated Negative Declaration of the project.

The project is an allowable use within the SEADIP and will not result in any change in land use. The project is consistent with applicable General Plan land use and zoning designations, will be constructed within the industrial site boundaries of the existing power plant site, and is similar to adjacent industrial uses. Therefore, the project will not contribute to cumulative impacts on land use.

The AEC would not involve conversion of agricultural land, so there will be no cumulative impacts on agricultural resources resulting from the project. The project is consistent with land use plans and policies, and compatible with adjacent uses. Therefore, the project will not contribute to cumulative impacts associated with land use compatibility. Moreover, there are no proposed projects that would result in adjacent incompatible land uses.

III. Response to Certain Issues Raised in the FSA

No comments on the FSA.

IV. Proposed Licensing Conditions

No Conditions of Certification are proposed for Land Use.

Noise

I. Introduction

A. Names: Mark Bastasch

B. Qualifications: The panel's qualifications are as noted in their resumes contained in Appendix A.

C. Prior Filings: In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- AES Alamitos Energy, LLC, Supplemental Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #206427-1 through 206427-6 and 206428-1 through 206428-3), October 23, 2015.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Data Responses, Set 6 (Response to Data Requests 83 to 168) (TN #207013), December 14, 2015.
- AES Alamitos Energy, LLC, Alamitos Energy Center (13-AFC-01): Removal of Temporary Secondary Construction Access Road (TN #210632), March 7, 2016.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Preliminary Staff Assessment Initial Comments (TN# 212487), July 27, 2016.

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of my knowledge and belief. To the extent this testimony contains opinions, such opinions reflect my best professional judgment. I make these statements, and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

II. Summary of Testimony

A. Affected Environment

The AEC site and the surrounding vicinity has numerous existing industrial operations such as the existing AGS, other power generation facilities, oil storage tank farms, in addition to several major air and ground transportation corridors.

The closest residence to the noise-producing equipment is located approximately 1,200 feet to the west of the AEC CCGT. An additional residential area is located approximately 1,300 feet to the east of the noise-producing equipment, on the other side of the San Gabriel River and to the east of LADWP's Haynes Generating Station.

B. Potential Construction Related Impacts; Avoidance and Minimization Measures

Construction activities at the AEC site are expected to be typical of other construction projects in terms of equipment used and types of activities performed. The noisiest construction activities will be confined to daytime hours. Activities for the demolition of the remaining components of AGS Unit 7 (hereinafter described as "demolition"), located on the AEC site, will use equipment similar to that used for construction activities; therefore, the range in equipment sound levels during demolition activities is expected to be the same as construction activities. The demolition of the other existing AGS units is not required to construct the AEC, and is not part of the AEC project.

Construction noise impacts potentially harmful to the health and hearing of construction workers will be reduced to a level below significance by preparation and execution of a Hearing Protection Plan, which complies with California Occupational Safety and Health Administration (Cal-OSHA) requirements.

Noise generated during the testing and commissioning phase of the project is not expected to be substantially different from that produced during normal full-load operation. Starts and abrupt stops are more frequent during this period, but on the whole they are usually short-lived.

C. Potential Operational Related Impacts; Avoidance and Minimization Measures

Outdoor levels throughout the plant will typically range from 90 dBA near certain equipment to roughly 65 dBA in areas more distant from any major noise source. A hearing conservation program will be developed to address potential noise impacts to operations personnel. Therefore, noise impacts to workers during operation will be less than significant.

The Applicant agrees with the conclusions of the Staff as they relate to Condition NOISE-4. Staff considered the variability in existing ambient noise levels in the FSA and also appropriately considered the operation of the LADWP's Haynes Generating Station (specifically, the six GE LMS 100 gas turbines that repowered Haynes Generating Station Units 5 and 6). Based on the totality of the analyses, the Applicant agrees with Staff's conclusions and finds Condition NOISE-4 acceptable.

D. Summary of Compliance with Applicable LORS

The SAFC summarizes the applicable City of Long Beach LORS for both construction and operation. AEC will limit the noisiest construction activities to the daytime hours consistent with LORS. Operational noise from the project, with noise control incorporated in the design, will comply with applicable City of Long Beach limits. Staff concludes that, if built and operated in conformance with the proposed Conditions of Certification, AEC would comply with all applicable noise and vibration LORS. The Applicant agrees with these conclusions.

E. Summary of the Potential Cumulative Impacts

Potential cumulative noise impacts from construction and/or operation of the proposed project are not expected to differ from those of the project alone. Other pending projects have not been identified as substantial sources of noise in the project vicinity, with the exception of LADWP's repowering of the Haynes Generating Station Units 5 and 6, which was constructed in 2013 and is now operational. (The FSA also references the potential repowering of the Haynes Generating Station Units 1 and 2, but the scope and timing of this project is speculative.) The repowered Haynes Generating Station Units 5 and 6 was predicted to result in 62 dBA in Leisure World, while AEC is anticipated to result in 53 dBA in Leisure World (M3). If both levels were realized simultaneously, the increase would be 1 dBA. When comparing similar sounds, a 3 dBA increase is considered the threshold of a perceivable difference. Given the Conditions of Certification proposed for AEC, no significant noise or vibration cumulative impacts are anticipated to occur.

III. Response to Certain Issues Raised in the FSA

No comments on the FSA.

IV. Proposed Licensing Conditions

The Applicant agrees with the Conditions of Certification for Noise (NOISE-1 through NOISE-8) as set forth in the FSA.

Paleontological Resources

I. Introduction

A. Names: James Verhoff

B. Qualifications: The panel's qualifications are as noted in their resumes contained in Appendix A.

C. Prior Filings: In addition to the statements herein, this testimony includes by reference the following documents submitted in this proceeding:

- AES Alamitos Energy, LLC, Supplemental Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #206427-1 through 206427-6 and 206428-1 through 206428-3), October 23, 2015.
- AES Alamitos Energy, LLC, Alamitos Energy Center (13-AFC-01): Removal of Temporary Secondary Construction Access Road (TN #210632), March 7, 2016.

To the best of my knowledge, all of the facts contained in this testimony (including all referenced documents) are true and correct. To the extent this testimony contains opinions, such opinions are my own. I make these statements, and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

II. Summary of Testimony

A. Affected Environment

The project area lies in the City of Long Beach, California. The project area lies in the southern portion of the Los Angeles Basin, east of the Pacific Ocean and approximately 1 mile northeast of Alamitos Bay; the San Gabriel River lies approximately 0.75 mile to the east. The present shoreline of the Pacific Ocean is approximately 1.8 miles to the southwest, and the project site lies adjacent to one of several channelized sections of the lower San Gabriel River. Prior to development and channelization, the project area likely would have been an estuarine, lagoonal habitat near the mouth of the San Gabriel River. A largely continuous long-shore beach would have offered a barrier separating this estuarine habitat from San Pedro Bay. The plain of the Los Angeles Basin extends to the north and northwest of the project site, punctuated by isolated uplifts such as the Dominguez Hills and the Palos Verdes Hills. The basin is bounded by the Santa Monica and San Gabriel mountains to the north, the Pacific Ocean to the west and south, and the highlands of the Puente Hills and Chino Hills to the north, and the Santa Ana Mountains to the south.

The Los Angeles Basin developed in the Late Miocene in response to tectonic events encompassing regional pull-apart of a quiescent continental shelf margin, and the basin reached a maximum depth of approximately 6,000 feet. The basin rapidly filled with near-shore marine sediment for the next 10 million years or more. This basin, now filled with marine sediment with a veneer of Quaternary continental sediment less than a few hundred feet thick in most cases, has been heavily deformed by regional faulting and folding, with oil and natural gas having migrated through the permeable marine sediments to become trapped by these structures. During the last glacial age and during prior glacial ages that occurred during the Middle and Late Pleistocene (the last 0.7 million years), sea level was hundreds of feet below that of the present level, and consequently for much of the last million years the project area lay on a vast coastal plain, with the shoreline some distance to the west.

The surface geology of the project area has been masked by historical and modern urban development. Where native soil is present in the region, it represents sands and silts associated with paralic habitats, beach deposits and, further inland, estuarine silts of tidal lagoons, as well as fluvial silts and sands of the

San Gabriel River. Near-shore marine deposits also add to the array of sediments that reflect the complex interaction of the San Gabriel River and the Pacific Ocean over the past ten thousand years. Prior to that time, during the Late Pleistocene, the ocean shore and its associated habitats lay many miles farther west, and this area was a semi-arid coastal plain.

Available geologic maps indicate that the project area is underlain by active or recently active eolian (sand dune and sand sheet) deposits and Recent and Older alluvial and stream deposits. Marine terrace deposits lie approximately 3 miles to the southeast, on what appears to have been the southern edge of the broad deltaic zone created by the San Gabriel River mouth. Older surfaces with marine terraces are not recorded closer to the project site and instead, in this area, Holocene sediments extend to some depth. The nearest outcrops of consolidated rock units lie about 11 miles to the west, in the Palos Verdes Hills. The project area has been heavily graded, and fill was also imported to level the surface and reclaim estuarine habitat in the mid-twentieth century. This stratum of fill extends 6 to 9 feet below ground surface.

Prior to development, the uppermost sediments in the project area consisted predominantly of alluvial and fluvial sediments of the San Gabriel River further inland, with minor paralic (near-shore and beach) deposits, dominated by recent eolian sands. The San Gabriel River, as well as the Los Angeles River, whose mouth is approximately 7 miles farther west along the shore, are the ultimate sources of these sands; channelized courses of the San Gabriel River lie to both the east and west of the project site. More than 50 feet below the surface, these younger paralic and alluvial deposits give way to Late to Middle Pleistocene sediments. The thickness of the Pleistocene sediments is highly variable and dependent (among other things) on the location of the ancient river course and local uplift associated with the Dominguez Hills, which are less than a mile to the northwest of the western terminus of the proposed wastewater line. These deposits likely grade into the Late to Middle Pleistocene marine terrace deposits, which generally consist of red silty sand, and are shown as units Qopa, Qopc, and Qops.

Twelve separate subunits are recognized, and five are located within the project site and along its associated pipeline corridor. One is artificial fill (af), another is younger alluvium (Qyaf), and three are different facies of older Quaternary marine terrace deposits (Qopa, Qopc, and Qops). It should be noted that, at present, only disturbed sediment and artificial fill can be observed at the surface; the geology is to a large extent reconstructed predevelopment conditions.

Older Tertiary marine sandstones are exposed by local uplift in the Dominguez Hills less than one mile northwest of the western terminus of the proposed LBWD wastewater line. Because these units lie well below the depth of any anticipated construction activity in the vicinity of the project which, as noted previously, lies chiefly in the lowland, deltaic area associated with the historic San Gabriel River mouth, these units were not analyzed further.

A summary of the results of these searches as they apply to the geological units occurring within the project area is provided below:

- **Disturbed Sediment / Artificial Fill:** These units, including artificial fill and modern surficial deposits, do not include scientifically significant fossils. Any fossils found in these units would be out of stratigraphic context and mechanically damaged, reducing their scientific significance to nil. This is the only sediment type exposed at the surface in the project area.
- **Younger Quaternary Alluvium and Paralic Deposits:** Although the available geological mapping does not show younger paralic deposits to be present in the project area, as discussed previously, geotechnical borings show that they are at relatively shallow depth and intergrade with alluvial sediments. Scientifically significant fossils are rarely attributed to Holocene deposits, which constitute most of this unit. This sediment extends to a depth of approximately 50 feet in the main project area, and may include latest Pleistocene sediments near its base. Geotechnical studies of the

AEC site have found root casts and shell fragments starting at 15 feet below ground surface (bgs) in alluvium, likely to be early Holocene in age. Older Pleistocene sediments are expected to be well below the maximum depth of excavations of approximately 20 feet.

- **Older Quaternary Paralic Deposits:** Although no fossil records can be directly attributed to these geological units, and marine terrace deposits are often altered by soil formation processes that generally destroy fossils, they can also yield mollusks that are useful in assigning ages to marine terraces and their uplift.

The project area in general lies in an estuarine habitat. In the lower Los Angeles River channel, a geomorphic setting similar to the project area about 9 miles to the west, Pleistocene sediments (and significant fossil material) were encountered at depths exceeding 70 feet. Perhaps because few excavations reach that depth, the Quaternary alluvium in and near the project site has not yielded any significant vertebrate or plant fossils records.

Along with these well-studied formations, several finds were made at or off Seal Beach, which lies approximately 1.7 miles directly south of the project area. Unfortunately, these finds were out of stratigraphic context, and it is uncertain which stratigraphic unit they originated from. They include a mammoth tooth found just above the shoreline along the beach, and mammoth skull and teeth fragments found approximately 500 feet offshore. A bison horn core was also found near these mammoth remains. It appears likely that erosion of fossiliferous sediments in the wave zone off-shore is exposing Quaternary fossil material. These sites are all more than one mile from the project area. All fossil records in the area relate to material of uncertain provenance, dredged from the bottom of San Pedro Bay, or cast up on Seal Beach. Therefore, because there are no records of paleontological finds in the area that possess provenance, no map of paleontological sites is provided.

B. Potential Construction Related Impacts; Avoidance and Minimization Measures

The potential for construction of AEC to affect paleontological resources is directly proportional to the paleontological sensitivity of the geologic units encountered during construction-related excavations. Most sediments that will be affected by construction of this project are not paleontologically sensitive.

No paleontological sites with secure provenance are known for the area, although it is evident that erosion of Pleistocene sediments is occurring off-shore in the shallows of San Pedro Bay. This is, however, more than a mile from the project area, in a different geological setting. Within the project area, only those excavations disturbing older paralic sediments (subunits Qopa, Qopc, and Qops) have the potential to affect paleontological resources. Because these sediments are often altered by weathering, and usually yield only marine mollusks, they possess only moderate paleontological sensitivity. Supporting this is the fact that no paleontological sites are recorded in the vicinity of the project, other than the marine fossils localities discussed previously.

Because ground-disturbing activities have the potential to affect paleontological resources of moderate sensitivity, a paleontological resources mitigation and monitoring plan (PRMMP) should be developed and implemented.

Implementation of the following mitigation measures would assure that the potential impacts from project-related ground disturbance on paleontological resources would be maintained at an insignificant level.

Project Paleontological Resources Specialist

The project proponent will submit the name and resume of a qualified Paleontological Resource Specialist (PRS) to the CEC for review and approval. This individual will prepare the paleontological resources module of the worker education program and be available during the course of ground-disturbing construction in case there is an unanticipated paleontological discovery. The name

and contact information of the PRS will be provided to all construction management personnel, the compliance manager, and the cultural resource monitors (if any).

Development of a Paleontological Resources Monitoring and Mitigation Plan

A PRMMP will be drafted by the PRS, or under the supervision of the PRS and reviewed by the PRS prior to submittal. This plan will provide detailed instructions regarding which strata are paleontologically sensitive, for the monitoring of construction activities, and for sampling procedures and the curation of any paleontological resources found. The PRMMP will also outline communications protocols to be used during construction, both in the case of an unanticipated discovery and to ensure adequate monitoring takes place. This plan will also outline the procedures to be used to ensure adequate curation of any discovered paleontological resources.

Construction Personnel Education

Prior to working on the AEC site for the first time, personnel involved in earth-moving activities will be provided with Paleontological Resources Awareness Training. This training ideally would be provided as a module in the worker environmental awareness training. Construction personnel involved with or supervising excavations will be informed that fossils may be encountered and will be provided with information on the appearance of fossils, the role of paleontological monitors, and on proper notification procedures. This worker training will be prepared and initially presented by the PRS. Subsequent training may be conducted via video presentation and hard-copy training materials.

C. Potential Operational Related Impacts; Avoidance and Minimization Measures

No operational paleontological resource impacts are expected.

D. Summary of Compliance with Applicable LORS

Paleontological resources are protected by numerous federal regulations. Recently, President Obama signed into law the Omnibus Public Land Management Act of 2009 (H.R. 146). Regulations for implementing this law have yet to be developed by the affected agencies. Additional federal legislative protection for paleontological resources stems from the Antiquities Act of 1906 (PL 59-209; 16 United States Code 431 et seq.; 34 Stat. 225), which calls for protection of historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on federal lands. In addition, the National Environmental Policy Act of 1969 (United States Code, Section 4321 et seq.; 40 CFR, Section 1502.25), as amended, requires analysis of potential environmental impacts to important historic, cultural, and natural aspects of our national heritage. The CEC's review of the AEC analyzes the potential environmental impacts on important historic, cultural, and natural aspects of our national heritage, and proposed mitigation measures to ensure impacts are minimized to less-than-significant levels. Therefore, compliance with the federal law is expected.

The CEC's environmental review process under the Warren-Alquist Act is considered functionally equivalent to that of CEQA (PRC Sections 21000 et seq.). CEQA requires that public agencies and private interests identify the environmental consequences of their proposed projects on any object or site of significance to the scientific annals of California (Division I, California PRC: 5020.1 [b]). The CEQA Guidelines (PRC Sections 15000 et seq.) define procedures, types of activities, persons, and public agencies required to comply with CEQA. Appendix G in Section 15023 provides an Environmental Checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts. One of the questions to be answered in the Environmental Checklist (Section 15023, Appendix G, Section V, Part c) is the following: "Would the project directly or indirectly destroy a unique paleontological resource or site…?"

The CEQA lead agency having jurisdiction over a project is responsible for ensuring that paleontological resources are protected in compliance with CEQA and other applicable statutes. The CEC is the lead

agency with the responsibility to ensure that fossils are protected during AEC construction and operation. California PRC Section 21081.6, entitled Mitigation Monitoring Compliance and Reporting, requires that the CEQA lead agency demonstrate project compliance with mitigation measures developed during the environmental impact review process. The implementation of the paleontological resources Conditions of Certification will ensure compliance with CEQA.

The Los Angeles County General Plan places emphasis on the preservation of historic and cultural resources, including paleontological resources. However, this Plan does not include specific guidance for the preservation of paleontological resources. The implementation of the paleontological resources Conditions of Certification will ensure impacts to sensitive paleontological resources are reduced to less-than-significant levels.

The Society of Vertebrate Paleontology (SVP), an international organization of professional paleontologists, has established standard guidelines that specify acceptable professional practices in the conduct of paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, analysis, and curation. Most practicing paleontologists follow SVP guidelines, and extend those to address other types of fossils of scientific significance, such as invertebrate fossils and paleobotanical specimens. Many federal and state regulatory agencies, including the CEC, have informally adopted the SVP standard guidelines. The implementation of the paleontological resources Conditions of Certification will ensure compliance with the SVP guidelines and standards.

E. Summary of the Potential Cumulative Impacts

The potential of this project to contribute to cumulative impacts on paleontological resources is low. A layer of disturbed sediment and Holocene-age eolian sediments underlie the project area, and impacts to paleontological resources are only possible if construction-related excavation extends below these low-sensitivity sediments. If excavations reach depths where undisturbed sediment capable of producing fossils are encountered, the mitigation described below will reduce the contribution of the project to cumulative negative impacts on paleontological resources to negligible levels.

III. Response to Certain Issues Raised in the FSA

No comments on the FSA.

IV. Proposed Licensing Conditions

The Applicant agrees with the Conditions of Certification for Paleontology (PAL-1 through PAL-8) set forth in the FSA.

Socioeconomics

I. Introduction

A. Names: Fatuma Yusuf

B. Qualifications: The panel's qualifications are as noted in their resumes contained in Appendix A.

C. Prior Filings: In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- CH2M HILL, Alamitos Energy Center (13-AFC-01) Data Response Set 1A – Responses to CEC Staff Data Requests 1-8, 10-12, 16-17, 20-25, 38-44, 51-54, and 59-62 (TN #202381), May 27, 2014.
- AES Alamitos Energy, LLC, Supplemental Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #206427-1 through 206427-6 and 206428-1 through 206428-3), October 23, 2015.
- AES Alamitos Energy, LLC, Alamitos Energy Center (13-AFC-01): Removal of Temporary Secondary Construction Access Road (TN #210632), March 7, 2016.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Preliminary Staff Assessment Initial Comments (TN #212487), July 27, 2016.

The facts contained in this testimony (including all referenced documents) are true and correct to the best of my knowledge and belief. To the extent this testimony contains opinions, such opinions reflect my best professional judgment. I make these statements, and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

II. Summary of Testimony

A. Affected Environment

The AEC site is located within the boundaries of the existing and operating AGS property, located in the City of Long Beach, Los Angeles County, California. This power plant was formerly owned and operated by SCE.

B. Potential Construction Related Impacts; Avoidance and Minimization Measures

Site preparation and demolition of the remaining AGS Unit 7 components (hereinafter described as "demolition") is expected to start in January 2017, with the AEC CCGT construction expected to take approximately 34 months from June 2017 to March 2020. The construction of the AEC SCGT is expected to take approximately 16 months and is scheduled to occur between May 2020 and August 2021.

Construction Workforce. The primary trades required for AEC construction will include craft personnel such as boilermakers, carpenters, electricians, ironworkers, laborers, millwrights, operators, and pipefitters. Total construction personnel requirements for the AEC CCGT will be approximately 6,176 person-months. Construction personnel requirements for the AEC CCGT will peak at approximately 306 workers in July 2019. The total construction personnel requirements for the AEC SCGT will be approximately 3,544 person-months. The peak construction personnel requirements for the AEC SCGT will be approximately 512 workers in January 2021. The average workforce for both the AEC CCGT and the AEC SCGT over the 51-month construction period, excluding site preparation activities, will be 191 workers.

Available skilled labor workforce in Los Angeles-Long Beach-Glendale Metropolitan District (MD) will be more than adequate to fulfill the AEC's construction labor requirements. Therefore, the AEC will not place an undue burden on the local workforce. Additionally, AEC workforce requirements would not be expected to place undue burden on the local and regional workforce because Long Beach is within the major employment centers of southern California, such as the Los Angeles-Long Beach-Glendale MD, Riverside-San Bernardino-Ontario Metropolitan Statistical Area (MSA), and the San Diego-Carlsbad-San Marcos MSA, all of which have a large available construction workforce. Finally, the AEC peak construction needs are less than 1 percent (0.8 percent) of the total of the regionally available construction workforce. As a result, the construction activities associated with AEC will not result in a significant adverse impact on the construction labor supply in the area.

Population Impacts. It is anticipated that most of the AEC construction/demolition workforce will be drawn from Los Angeles County or the neighboring counties of Orange, Ventura, Kern, and San Bernardino. Additionally, a portion of the construction workforce could be drawn from other nearby counties in southern California. For the purposes of this analysis, because of the size of the local construction/demolition workforce, it was assumed that most workers will be from Los Angeles County. Because most workers are expected to commute to the AEC site on a daily basis, they will not contribute to a significant increase in the population of the area.

Housing Impacts. The construction workforce will most likely commute daily to the AEC site; however, if needed, there are numerous hotels/motels in Los Angeles County and other neighboring counties to accommodate workers who may choose to commute to the AEC site on a workweek basis. In addition to the available hotel/motel accommodations, there are a few recreational vehicle parks within driving distance of Long Beach and neighboring cities close to the AEC site. The AEC is not expected to significantly increase the demand for temporary housing (hotel/motels/recreational vehicle parks) in the AEC area because of the size of the local workforce. As a result, AEC construction is not expected to significantly increase the demand for permanent or temporary housing in the area.

Impacts on the Local Economy and Employment. The cost of materials and supplies (excluding major equipment) required for AEC during construction is estimated at $132.29 million. Although it is expected that most materials and supplies will be purchased in the greater southern California area, for the purpose of this analysis, the estimated value of materials and supplies that are assumed to be purchased locally in Los Angeles County during construction is $132.29 million. All cost estimates are in constant 2014 dollars, as are the economic benefits figures cited later in this section.

The AEC will provide about $315.55 million in construction payroll, at an average rate of $89 per hour, including benefits. The anticipated payroll for employees, as well as the purchase of materials and supplies during construction, will have a beneficial temporary impact in Los Angeles County and in the neighboring counties. Assuming conservatively that 90 percent of the construction workforce will reside in Los Angeles County, it is expected that approximately $284 million will stay in the Los Angeles County area during the AEC construction period. These additional funds will result in a temporary beneficial impact by creating the potential for other employment opportunities for workers in other service areas in Los Angeles County, such as transportation and retail. No significant adverse impacts are expected to result related to the local economy and employment.

Indirect and Induced Economic Impacts from Construction. AEC construction activities will result in secondary economic impacts (indirect and induced) in Los Angeles County. Indirect employment effects are those resulting from the purchase of goods and services by firms involved with construction. Induced employment effects are those effects resulting from construction workers spending their income within Los Angeles County. In addition to these secondary employment impacts, there are indirect and induced income effects arising from construction.

Indirect and induced employment in Los Angeles County were estimated at 125 and 464 jobs, respectively. Assuming an average direct construction employment of 191 for the AEC, the employment multiplier

associated with the construction phase of the project is approximately 4.1 (i.e., [191 + 124 + 464] / 191). This construction-phase employment multiplier is based on a Type SAM model.

Indirect and induced income impacts associated with the construction of the AEC were estimated at $6,513,950 and $20,168,770, respectively. Assuming a total annual local construction expenditure in Los Angeles County (payroll, materials, and supplies) of $77.9 million ($46.78 million in payroll + $31.13 million in materials and supplies), the AEC's construction-phase income multiplier based on the Type SAM model is approximately 1.3 (i.e., [$77,901,190 + $6,513,950 + $20,168,770] / $77,901,190).

Fiscal Impacts. The AEC's capital cost is estimated to be between $940 million and $1.11 billion. Local materials and supplies for construction are estimated at approximately $132.29 million. For the purposes of this analysis, all of the estimated $132.29 million in local purchases of materials and supplies during construction is assumed to be within Los Angeles County, with Long Beach being the point of sale for the $132.29 million for local purchases of materials and supplies.

The City of Long Beach sales tax rate is 9 percent (as of July 1, 2015). The split in the sales tax rate is as follows: 6.5 percent goes to the State; 0.25 percent goes to the County transportation funds; 0.75 goes to City operations; and 1.5 percent goes to the place of sale (California Board of Equalization [BOE], 2015).[12] The total sales tax expected to be generated during construction of the AEC is $11.9 million (i.e., 9.0 percent of local sales on $132.29 million in local purchases). Assuming all local sales are made in Long Beach, the maximum total sales tax revenues the City could receive would be $992,147 (0.75 percent of $132.29 million) during construction. No significant adverse fiscal impacts are expected to result from AEC construction.

Impacts on Education. AEC construction will not cause any population changes or housing impacts on the region because most, if not all, employees will commute to the site from within the region. As a result, AEC construction will not cause an increase in demand for school services. Even if some employees chose to relocate their families to areas within the Long Beach Unified School District, school enrollment has been decreasing, with a reduction of more than 2,500 students since the 2010-2011 school year. Therefore, there is sufficient capacity to absorb the children from the peak workforce of 447 workers.

Impacts on Public Services and Facilities. Construction will have minor, if any, impacts on the Long Beach police, fire, or hazardous materials handling resources, including medical and accident response, hazards identification, and other fire services. Implementation of safety procedures for the construction site, as required by applicable regulations and standards, will ensure that AEC construction does not create significant adverse impacts on medical or emergency resources in the area.

Impacts on Utilities**.** Construction of AEC will not result in significant adverse demands on local water, sanitary sewer, electricity, or natural gas. Water requirements for construction are relatively small. Given the relatively low number of workers, the impacts on the local sanitary sewer system would not be significant.

C. Potential Operational Related Impacts; Avoidance and Minimization Measures

Operational Workforce. The 36 operational staff will be drawn entirely from the existing plant staff of 66. Because no new operational staff will be employed at the AEC, no population increase is anticipated as a result of this project. There will be no significant adverse impacts on local employment from operations.

[12] California Board of Equalization. 2015. California City and County Sales and Use Tax Rates. Available at: hrrp://www.boe.ca.gov/sutax/pam71.htm. Accessed September 8, 2015.

Population Impacts. All 36 operations staff will be drawn from the staff at the existing plant. Consequently, no population increase is anticipated as a result of operation of the AEC.

Housing Impacts. Because the operational workforce would be from the existing plant workforce and because Los Angeles County and Long Beach vacancy rates indicate that housing is not considered limited, no significant impacts on housing are anticipated.

Impacts on the Local Economy and Employment. Operation of the AEC will generate a small, permanent beneficial impact by creating employment opportunities for local workers through local expenditures for materials, such as office supplies and services. The average salary per AEC operations employee, including benefits, is expected to be about $124,140 per year. For the assumed average of 36 full-time employees, this will result in an approximate operation payroll, including benefits, of $4,469,090 per year. There will be an annual operations and maintenance (O&M) budget of approximately $8,312,000, all of which is estimated to be spent locally within Los Angeles County. However, it is possible that some of this O&M budget may be spent in other neighboring counties. The additional jobs and spending will generate other employment opportunities and spending in Los Angeles County (including Long Beach), as well as in neighboring counties where these operational workers may reside or where these expenditures may occur. All cost estimates are in constant 2014 dollars, as are the economic benefits noted in this section. No adverse impacts on the local economy and employment are expected to result from AEC operations.

Indirect and Induced Economic Impacts from Operations. Operation of the AEC would result in indirect and induced economic impacts in Los Angeles County. These indirect and induced impacts represent permanent increases in the county's economic variables. The indirect and induced impacts would result from annual expenditures on O&M.

Estimated indirect and induced employment in Los Angeles County would be 14 and 13 permanent jobs, respectively. The additional 27 jobs result from the $8,312,000 in local annual expenditures during operation.

Indirect and induced income impacts are estimated at $2,007,560 and $669,190, respectively. The income multiplier associated with the operational phase of the AEC is approximately 1.3 (i.e., [$8,312,000 + $2,007,560 + $669,190] / $8,312,000) and is based on a Type SAM model.

Fiscal Impacts. The AEC annual non-payroll O&M budget is expected to be approximately $8,312,000 (in 2014 dollars), and for the purpose of this analysis, it is assumed that all of the budget will be spent in Los Angeles County (including Long Beach). As stated earlier, the AEC will bring about $4,469,090 million per year in operational payroll to the region; however, because all the O&M employees will be drawn from the existing plant staff, this operational payroll will not be new money flowing into the regional economy and, as such, does not represent an increase in benefits.

Although the materials and supplies required during the operational phase of the AEC could come from within Los Angeles County (including Long Beach) or from the neighboring counties in southern California, for the purposes of this analysis, it is assumed that all of the O&M purchases will be made in Long Beach. Based on the assumed annual local O&M expenditures of $8,312,000, the estimated sales taxes (9 percent) will be approximately $748,080 per year. The City of Long Beach is assumed to realize approximately $187,020 (2.25 percent of $8,312,000) annually in sales tax revenues from AEC operation. The overall anticipated increase in sales tax revenue will be beneficial but will not be significant, because it would constitute only a small percent of the City of Long Beach's sales tax revenues.

The AEC is expected to bring increased property tax revenue to the City of Long Beach. The BOE has jurisdiction over the valuation of a power generation facility for property tax purposes, if the power

plant produces 50 MW or more (Young, 2007).[13] Although the BOE assesses the property value, the property tax rate for the AEC is set by the Los Angeles County Assessor's Office. For the existing AGS property, this rate is 1.122072 percent for the most recent fiscal year (FY 2011-12). Based on the assumed capital cost of between $0.94 billion and $1.11 billion, the AEC will generate approximately between $10.55 million and $12.45 million in property taxes annually. However, the increase to the City of Long Beach will be the difference between the estimated property tax and the amount of property tax currently paid on the existing AGS property. The property tax assessed on the existing AGS in FY 2011-12 was $2.63 million. Thus, the estimated increase in property tax revenues generated by the construction of the AEC will be approximately $7.92 million to $9.82 million.[14] Because the property taxes are collected at the county level, their disbursement is also at the county level. The net increase in property taxes resulting from the AEC (adjusted by the amount currently paid for AGS) would be between 6.9 and 7.5 percent of the City's total FY 2011-12 tax revenues. Thus, the additional property tax revenues generated will be significant and beneficial to the City of Long Beach.

Impacts on Education. Because all 36 operational employees will be drawn from the existing staff, there will be no impact on the schools. Additionally, the construction of the AEC will generate revenues for the school district. Any industrial development in the Long Beach Unified School District is charged a one-time developer fee of $0.56 per square foot of commercial development. Based on the approximately 16,250 square feet of occupied structures and the $0.56 per square foot developer fee, the AEC will pay a one-time amount of $9,100 in school impact fees.

Impacts on Public Services and Facilities. AEC operations will not result in any new demands on public services or facilities because all of the 36 operational employees will be drawn from the existing operational workforce. Thus, the AEC's operation is not expected to result in significant impacts on either the Long Beach Fire Department or the Long Beach Police Department. The AEC's operation would not create significant adverse impacts on medical resources in the area given the safety record of power plants and few operations staff.

Impacts on Utilities. AEC operations will not result in a significant adverse demand on local water, sanitary sewer, electricity, or natural gas because these utilities are currently supplied to the existing AGS, and the AEC will result in a net reduction in demand on all of these services.

D. Environmental Justice

President Clinton's Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," was signed on February 11, 1994. The purpose of this Executive Order is to ensure that federal agencies consider whether a project may result in disproportionately high and adverse human health or environmental effects on any minority or low-income population.

The federal guidelines set forth a three-step screening process:

1. Identify which impacts of the project are high and adverse.
2. Determine whether minority or low-income populations exist within the high and adverse impact zones.

[13] Young, D. 2007. Personal communication between Fatuma Yusuf of CH2M HILL and David Young, Senior Specialist Property Appraiser, Property and Special Tax Department, California Board of Equalization. August 2.

[14] The property tax assessed on the existing generating station in FY 2011-2012 of $2.63 million included both the existing infrastructure (the generating station facility) as well as the property/land. Although the difference between the FY 2011-2012 tax bill and the property tax revenue for the AEC is estimated to be an increase of $7.92 million and $9.82 million, respectively, this is a conservative amount because it does not take into account that the property/land also will be reassessed after construction of the AEC is complete. Therefore, it is likely that additional annual property tax revenue will be generated in excess of $9.82 million.

3. Examine the spatial distribution of high and adverse impact areas to determine whether these impacts are likely to fall disproportionately on the minority or low-income population.

According to the guidelines established by the EPA (EPA, 1996)[15] to assist federal agencies to develop strategies to address this circumstance, a minority or low-income population exists if the minority or low-income population percentage of the affected area is 50 percent or more of the area's general population. The guidance suggests using two or three standard deviations above the mean as a quantitative measure of disparate effects.

The AEC does not create significant and adverse impacts. Therefore, there will be no disproportionately high and adverse human health or environmental effects on any minority populations and low-income populations resulting from the construction, demolition, and operation activities for the AEC.

E. Summary of Compliance with Applicable LORS

Federal, state, county, and local LORS applicable to socioeconomic are discussed below. AEC is expected to comply with applicable federal, state, and local LORS.

Federal LORS

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires federal agencies to consider whether the project may result in disproportionately high and adverse human health or environmental effects on any minority or low-income population. Although the CEC is not subject to this executive order, since the signing of the Executive Order 12898, the CEC has typically included this topic in its power plant siting decisions to ensure that any potential adverse impacts are identified and addressed. As stated above, there are no environmental justice concerns because AEC will not result in significant adverse impacts.

State LORS

Government Code Sections 65996 and 65997 provide the exclusive methods of considering and mitigating impacts on school facilities that might occur as a result of the development of real property. Education Code Section 17620, listed in Government Code Section 65997 as an approved mitigation method, allows school districts to levy a fee or other requirement against construction within the boundaries of the school district for the purpose of funding construction of school facilities. AEC will provide the required school development funding prior to the start of construction.

F. Summary of the Potential Cumulative Impacts

Cumulative socioeconomic impacts may occur when more than one project has an overlapping construction schedule that creates a demand for workers that cannot be met by local labor, resulting in an influx of non-local workers and their dependents and resulting in excessive demand on public services.

The potential for a sufficient worker demand that could pull workers from out of the area and lead to some stress on public facilities and utilities is counterbalanced by the current weakened labor market following the recent economic recession, which has affected the building trades industries particularly hard, and the AEC's low worker requirements. Although the pace of the economic recovery has been slow and forecasters do not anticipate full recovery to the pre-2008 levels until mid-decade, it is not anticipated that AEC will, in conjunction with these other projects, cause an influx of construction workers into the AEC area.

[15] U.S. Environmental Protection Agency. 1996. Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses. July 12.

Counterbalancing any potentially high demand for construction workers in the Los Angeles-Long Beach-Glendale MD is the fact that AEC construction and the construction of the identified cumulative projects can draw construction workers from the entire southern California area. The AEC would use less than 1 percent of the 2010-2020 projected construction workforce in the Los Angeles-Long Beach-Glendale area. It is very unlikely that worker demand would be sufficiently high to cause the relocation of large numbers of workers and dependents.

Finally, AEC peak construction needs are less than 1 percent of the total 2014 construction workforce. As a result, the AEC will not result in a significant adverse impact on the construction labor supply in the area. Additionally, there is a sufficient supply of skilled labor in Los Angeles County. Other kinds of cumulative socioeconomic impacts are also unlikely, as the AEC's effects on housing, schools, and public services would be negligible.

III. Response to Certain Issues Raised in the FSA

No comments on the FSA.

IV. Proposed Licensing Conditions

The Applicant agrees with the Conditions of Certification for Socioeconomics (SOCIO-1 and SOCIO-2) set forth in the FSA.

Soils

I. Introduction

A. Names: Steve Long

B. Qualifications: The panel's qualifications are as noted in their resumes contained in Appendix A.

C. Prior Filings: In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- AES Southland Development, LLC, Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #201620-1 through 201620-72), December 27, 2013.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Data Adequacy Supplement (TN #201751), February 17, 2014.
- AES Alamitos Energy, LLC, Supplemental Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #206427-1 through 206427-6 and 206428-1 through 206428-3), October 23, 2015.
- AES Alamitos Energy, LLC, Alamitos Energy Center (13-AFC-01): Removal of Temporary Secondary Construction Access Road (TN #210632), March 7, 2016.

The facts contained in this testimony (including all referenced documents) are true and correct to the best of my knowledge and belief. To the extent this testimony contains opinions, such opinions reflect my best professional judgment. I make these statements, and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

II. Summary of Testimony

A. Affected Environment

The AEC site is located within the boundaries of the existing and operating AGS. This power plant was formerly owned and operated by SCE. SCE previously operated the plant using both natural gas and fuel oil until 1989, when fuel oil was permanently retired as a fuel source.

The AEC is located on alluvial soils that have been overlain by construction fill during construction of the AGS. This fill was graded to a nearly level condition prior to construction. Fill at the site was characterized as generally consisting of loose to medium dense, sandy silt and fine-grained sand with silt and clay, reaching to a depth of 6 to 9 feet. The fill is underlain by alluvial soils. It is expected that these fill soils were compacted during construction of the AGS to provide a suitable surface for construction.

Natural Resources Conservation Service (NRCS) soils information was used as a baseline for the determination of soil erosion potential because of the variability of fill at the AEC site. While site-specific Soil Survey Geographic Database data were not available for this area of Los Angeles County, a description of the native soils in the project area was developed using the online U.S. General Soil Map for California (STATSGO2; NRCS, 2006).[16] Although STATSGO2 general soil map information is most often used for evaluations on a regional scale, it was used in this evaluation because it was the best-available NRCS soils information for the AEC site.

[16] Natural Resources Conservation Service. 2006. U.S. General Soil Map (STATSGO2). Available online at: http://soildatamart.nrcs.usda.gov. Verified June 27, 2013.

A single soil association was mapped for the entire project area, the s1026–Urban Land-Sorrento-Hanford Association.

Based on a review of land use designations, windshield surveys in the surrounding areas, and recent aerial photography, no agricultural production occurs within one mile of the AEC site.[17] At least a portion of the property may have been in agriculture prior to the site being developed as a power generating facility in the 1950's. Since that time, the area has been zoned and developed for industrial, commercial, and urban residential uses.

Undeveloped areas occur immediately to the west and south of the AEC site; however, they are also zoned for non-agricultural uses and would likely be unsuitable for commercial crop production. The area to the west and southwest of the AEC contains the Los Cerritos Wetlands. The Los Cerritos Wetlands are generally undeveloped, although infrastructure for oil extraction exists (gravel roads and oil derricks). Given the current and historical land uses, the AEC site and the undeveloped areas near the AEC site are likely unsuitable for commercial crop production.

Based on the previously developed nature of the AEC area, no wetlands or waters of the U.S. are present within the AEC site. Areas south and west of the AEC site are within the Los Cerritos Wetland Complex; this area is the focus of restoration work.

The entire region is mapped as Urban Land-Sorrento-Hanford association (s1026). These soils formed on floodplains and alluvial fans, and consist of fine sandy loam or heavy loam over sandy loam.

B. Potential Construction Related Impacts; Avoidance and Minimization Measures

The AEC site is not located on or near any farmland and is not located within or near any areas zoned for agricultural use or areas having a Williamson Act contract. The project will not result in the conversion of any agricultural land to a non-agricultural use. Similarly, the AEC project will not involve other changes in the existing environment that, due to their location or nature, could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use.

Based on the previously developed nature of the AEC site, there are no wetlands or waters of the U.S. present within the AEC site. Therefore, the project will not directly affect wetlands that could be regulated as wetlands or waters of the U.S. or State.

Potential impacts on soil resources during AEC construction and demolition of the remaining components of AGS Unit 7 that remain on the AEC site (hereinafter, "demolition") can include increased soil erosion, sediment transport, and soil compaction. Soil erosion causes the loss of topsoil and can increase the sediment load in surface water bodies near the construction site. The magnitude, extent, and duration of construction/demolition-related impacts depend on the erodibility of the soil; the proximity of the construction activity to the receiving water; and the construction methods, duration, and season.

Because conditions that could lead to excessive soil erosion via water are not present at the AEC site, relatively little soil erosion from rain events is expected during the construction and demolition periods. Additionally, BMPs will be implemented during AEC construction and demolition in accordance with a site-specific SWPPP that will be prepared to comply with the National Pollutant Discharge Elimination System general construction stormwater permit required under the Clean Water Act (CWA) for all construction projects over one acre in size. Monitoring will involve inspections to ensure that the BMPs described in the SWPPP are properly implemented and effective. Therefore, impacts from soil erosion via water during construction and demolition activities are expected to be less than significant.

[17] A small section of land designated as Unique Farmland occurs within the study area located approximately 0.6 mile northeast of the site within the City of Seal Beach. This Unique Farmland is a community garden managed by the City's Community Services Department within the Edison Park & Gardens with plots available to residents of Seal Beach.

The potential for wind erosion of surface material emitted as a result of grading will be minimized with the implementation of BMPs and mitigation measures. Therefore, the expected impacts of soil erosion from wind are considered to be less than significant.

Soils at the AEC site were found to be predominantly composed of sandy silt and fine-grained sand with silt and clay. These soils are considered to be low to moderately expansive. The site-specific potential for expansive soils and site-specific recommendations addressing such soils at the AEC will be developed in the project's detailed design phase. The site-specific geotechnical evaluation during detailed design and the design recommendations for expansive soils, the presence of expansive soils is not expected to create a substantial risk to life or property. For this reason, the potential for an adverse impact related to expansive soils is considered to be less-than-significant.

Preliminary geotechnical laboratory testing of limited soils samples indicated that the site contains soils that are corrosive to concrete and metals (Ninyo & Moore, 2011).[18] Corrosive soil conditions may cause premature deterioration to underground structures, foundations, and pipelines. Consistent with industry standards and practices, specific measures to reduce the potential effects of corrosive soils such as epoxy and metallic protective coatings, the use of alternative (corrosion resistant) materials, and selection of the appropriate type of cement and water/cement ratio will be incorporated into the design of the project. Specific measures to reduce the potential effects of corrosive soils would be developed in the detailed design phase. Typical mitigation measures to deal with corrosive soils include removal of near-surface corrosive soils and replacement with low-corrosion material during construction, or designing project improvements to resist the effects of corrosive soils.

C. Potential Operational Related Impacts; Avoidance and Minimization Measures

Potential operational impacts to soils is in the form of air emissions from the exhaust stacks. Air emission include, but are not limited to, NO_x and particulates (PM_{10}). Nitrogen oxide gases (NO and NO_2) convert to nitrate particulates in a form that is suitable for uptake by most plants and could promote plant growth and primary productivity. The majority of the area surrounding the AEC is urban or industrial land; the addition of small amounts of nitrogen to these areas would be insignificant. Within the more vegetated residential areas, the addition of small amounts of nitrogen would be insignificant within the context of existing ambient air quality, fertilizers, herbicides, and pesticides likely used by homeowners.

Therefore, with the use of inherently low sulfur natural gas, best combustion practices, emission controls, and monitoring, which will be incorporated into the AEC design, soil impacts from AEC operating air emissions will be less than significant.

D. Summary of Compliance with Applicable LORS

Federal, state, county, and local LORS applicable to soils are discussed below. AEC is expected to comply with applicable federal, state, and local LORS.

Federal Clean Water Act. The 1972 Amendments to the Federal Water Pollution Control Act, commonly referred to as the CWA, establish requirements for discharges of stormwater or wastewater from any point source that would affect the beneficial uses of waters of the U.S. Section 402 of the CWA effectively prohibits discharges of stormwater from construction sites unless the discharge is in compliance with an NPDES permit. The State Water Resources Control Board (SWRCB) is the permitting authority in California and has adopted a statewide general permit for stormwater discharges associated

[18] Ninyo & Moore. 2011. *Preliminary Geotechnical Evaluation – Alamitos Generating Station*. October 19.

with construction activity (General Construction Permit; SWRCB, 2009)[19] that applies to most projects resulting in one or more acres of soil disturbance. The AEC is within the San Gabriel River watershed and would result in disturbance of more than one acre of soil. Therefore, the project would need to be covered under the General Construction Permit and develop and implement a site-specific SWPPP to meet permit requirements.

U.S. Department of Agriculture Engineering Standards. Sections 2 and 3 of the U.S. Department of Agriculture, NRCS National Engineering Handbook (NRCS, 1983)[20] provides standards for soil conservation during planning, design, and construction activities. Adherence to these standards during AEC construction will reduce soil erosion from grading and construction activities.

E. State LORS

California Porter-Cologne Water Quality Control Act. The Porter-Cologne Water Quality Control Act (California Water Code, Division 7) provides for overall regulation under state law of water quality affecting all state waters, including both surface waters and groundwater. Under the Porter-Cologne Water Quality Control Act, the SWRCB has the ultimate authority over water quality policy, and nine Regional Water Quality Control Boards (RWQCB) oversee water quality on a day-to-day basis at the local/regional level. The Los Angeles RWQCB controls surface water discharges in the AEC area, and the project would need to meet water quality standards that are identified in the Water Quality Control Plan (Basin Plan) for this region.

Uniform Building Code. Table 18-1-B of the Uniform Building Code (International Code Council, 1997) defines the criteria for expansive soils. Building code regulations and enforcement have been adopted and incorporated into the City of Long Beach Municipal Code (LBMC). The project would be subject to the requirements of the LBMC.

Local LORS

The LBMC includes requirements for grading permits, including exceptions (Chapter 18.04), and outlines the documents required to accompany a permit application (Chapter 18.05).

The LBMC (Chapter 18.61) notes that any construction activity that will disturb more than one acre of soil is subject to the General Construction Activities Stormwater Permit, approved by the SWRCB (5-7.216) (also referred to as the General Construction Permit). Construction plans for sites with more than one acre of soil disturbance are required to include construction activity BMPs and erosion and sediment control BMPs. In addition, a SWPPP is required to be submitted to the City, and shall include appropriate construction site BMPs. Sites with more than five acres of soil require a SWPPP.

F. Summary of the Potential Cumulative Impacts

The soil conditions associated with the AEC site are reported to have only a slight water erosion hazard. Given the previous industrial development of the soils in the project area, construction fills are already expected to be relatively compact and stable. Furthermore, by applying construction BMPs that are typically required as part of the permitting process, it is expected that the effect on soils of construction activities will be minimal.

During AEC operation, periodic maintenance activities will not result in ground disturbance; therefore, soil impacts associated with AEC operation will be negligible and less than significant.

[19] State Water Resources Control Board. 2009. General Construction Activities Stormwater Permit (GASP). General Construction Permit (online). Available online at: http://www.swrcb.ca.gov/water_issues/programs/stormwater/constpermits.shtml. Verified June 27, 2013.

[20] Natural Resources Conservation Service. 1983. *National Engineering Handbook*.

The AEC will have no effect on agriculture because no agricultural uses occur nearby. The AEC's effects on soil erosion, sedimentation, and compaction will also be minor to negligible, and are not considered to be significant, particularly with the application of onsite BMPs. The AEC site and surrounding area are already developed for urban and industrial uses. Further development is not expected to contribute significantly to soil loss and erosion. Therefore, the potential for cumulative impacts of the AEC combined with other projects would be low.

III. Response to Certain Issues Raised in the FSA

No comments on the FSA.

IV. Proposed Licensing Conditions

No Conditions of Certification are proposed for Soils.

Traffic and Transportation

I. Introduction

A. Names: Loren Bloomberg. P.E.

B. Qualifications: The panel's qualifications are as noted in their resumes contained in Appendix A.

C. Prior Filings: In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- CH2M HILL, Alamitos Energy Center (13-AFC-01) Data Response Set 1A – Responses to CEC Staff Data Requests 1-8, 10-12, 16-17, 20-25, 38-44, 51-54, and 59-62 (TN #202381), May 27, 2014.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Data Responses, Set 2 (Responses to Data Requests 64 to 68) (TN #202867), August 1, 2014.
- AES Alamitos Energy, LLC, Supplemental Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #206427-1 through 206427-6 and 206428-1 through 206428-3), October 23, 2015.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Data Responses, Set 6 (Response to Data Requests 83 to 168) (TN #207013), December 14, 2015.
- AES Alamitos Energy, LLC, Alamitos Energy Center (13-AFC-01): Removal of Temporary Secondary Construction Access Road (TN #210632), March 7, 2016.
- CH2M, Alamitos Energy Center (13-AFC-01) Response to Informal Data Request (TN #211654), May 25, 2016.
- API 661 Air-Cooled Heat Exchanger – Specification Sheet (TN #211759), May 25, 2016.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Preliminary Staff Assessment Initial Comments (TN# 212487), July 27, 2016.

The facts contained in this testimony (including all referenced documents) are true and correct to the best of my knowledge and belief. To the extent this testimony contains opinions, such opinions reflect my best professional judgment. I make these statements, and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

II. Summary of Testimony

A. Affected Environment

AES will construct, own, and operate the AEC, a natural-gas-fired, air-cooled, combined-cycle and simple-cycle, electrical generating facility in Long Beach, California. The AEC will have a nominal generating capacity of 1,040 MW. The AEC will be located on an approximately 21-acre site within the larger 71.1-acre AGS parcel.

Regional access to the AEC site is provided from Interstate 405 (I-405), I-605, SR 22/East 7th Street, and SR 1/PCH. Local access to the project site is primarily provided from East 7th Street, North Studebaker Road, Loynes Drive, East 2nd Street, and PCH.

B. Potential Construction Related Impacts; Avoidance and Minimization Measures

The peak AEC construction or demolition of Unit 7 (hereinafter, "demolition") period will require up to 512 workers, including craft people, supervisory, support, and construction management personnel. The

peak workforce will occur during the year 2021. The construction plan is based on a single 10-hour shift Monday through Friday, and an 8-hour shift on Saturday. Construction will typically take place between 7:00 a.m. and 7:00 p.m., Monday through Friday, and 9:00 a.m. and 6:00 p.m. on Saturday.

Materials will be delivered to the site by truck. Some of the heavy equipment items will be transported by rail. Rail deliveries will be offloaded in the Long Beach area and transported by truck to the site. Truck deliveries of construction materials and equipment will generally occur on weekdays between 6:00 a.m. and 6:00 p.m. The peak truck deliveries will occur during month 42 when 28 trucks per day (for a total of 56 truck trips/day) will be transporting construction equipment and materials.

Based on an analysis of the AEC location and surrounding transportation facilities, the following assumptions were used to distribute the construction-workforce-related traffic over the study area network:

- One-third of the trips would come from Long Beach, Signal Hill, and communities located west of the AEC site.
- One-third of the trips would come from Lakewood, Los Alamitos, Cyprus, Cerritos, and communities located to the north of the AEC site.
- One-third of the trips would come from Garden Grove, Westminster, Fountain Valley, and communities located east and south of the AEC site.

The daily traffic volumes generated during the AEC peak construction/demolition period were added to the 2021 daily traffic volumes on each roadway segment. The project will not increase the Volume to Capacity (V/C) ratios on the study roadways by more than 2 percent. As such, construction traffic impacts on the study roadways are not considered significant.

Intersections were analyzed separately, and assessed for the peak hours. The AM and PM peak hour traffic generated during the peak construction/demolition period was added to the 2021 peak hour volumes at the analyzed intersections. During the morning peak hour, without mitigation measures, the project would increase the V/C ratio by 0.012 at the intersection of PCH and Seal Beach Boulevard, which exceeds the City of Seal Beach threshold of an increase of more than 0.01 for an intersection with an Intersection Capacity Utilization (ICU) greater than 0.90. The construction traffic in the morning peak hour is a significant but temporary impact. The change in the V/C ratio with the project-added traffic is below the City of Long Beach traffic impact thresholds.

During the afternoon peak hour, the changes in the V/C ratio with the project-added traffic are below the City of Long Beach and City of Seal Beach traffic impact thresholds. The project would not result in any intersection impacts during the afternoon peak hour.

In the absence of mitigation, the addition of AEC construction and demolition-related traffic could result in a significant but temporary impact at the one study intersection identified above at the intersection of PCH and Seal Beach Boulevard. This impact would only occur during the morning peak hour, with the added traffic associated with construction/demolition. As previously noted, the impact assessment was based on a conservative analysis, based on the assumption that the construction workforce would arrive during the morning peak hour.

A mitigation measure was developed to reduce the potential impact to a less-than-significant level: the construction and demolition contractors shall be required to prepare a Construction Transportation Management Plan (TMP). The TMP shall address:

- The employee work schedule during the peak construction period, to minimize arrivals during the morning peak hour when project impacts are anticipated. Specifically, the construction workforce will be scheduled to arrive at the site prior to 7:00 a.m. (Monday through Friday).

- The timing of heavy equipment and building material deliveries, potential street or lane closures, signing, lighting, and traffic control device placement. Damage to any roadway caused by project construction traffic will be restored to or near its preexisting condition based on the procedures established by the TMP. The construction contractors will work with the local agencies to prepare a schedule and mitigation plan for the roadways along the construction routes in accordance with the procedures established by the TMP.

With implementation of the TMP, the project's impacts on traffic and transportation will be less than significant.

C. Potential Operational Related Impacts; Avoidance and Minimization Measures

The project is anticipated to be fully operational by the end of 2021. During project operations, it is estimated that the project will generate 44 daily trips and 24 peak hour trips, which is significantly fewer than the project-related construction trips. Because the potential traffic impacts are already being evaluated for 2021 during peak construction, an additional quantitative analysis of the project operations for 2021 is not warranted.

Some of the hazardous materials produced during demolition, construction, and operations will include oil, oily rags, lead batteries, asbestos waste, solvents, and paint. Transportation of hazardous materials will comply with Caltrans, EPA, DTSC, CHP, and California State Fire Marshal regulations.

Similar to the currently operating AGS, aqueous ammonia, a regulated substance, will continue to be delivered to the AEC during operation and transported in accordance with California Vehicle Codes, which regulates the transportation of hazardous materials that pose an inhalation hazard. Hazardous waste generated at the AEC facility will be stored at the facility for less than 90 days. The waste will then be transported to an offsite treatment, storage, and disposal facility by a permitted hazardous waste transporter.

Federal Aviation Administration (FAA) Regulations establish standards for determining obstructions in navigable airspace and set forth requirements for notification of proposed construction. These regulations require FAA notification for construction over 200 feet above ground level. Notification also is required if the obstruction is lower than specified heights and falls within restricted airspace in the approaches to public or military airports and heliports. For airports with runways longer than 3,200 feet, the restricted space extends 20,000 feet (3.3 nautical miles) from the runway. For airports with runways measuring 3,200 feet or less, the restricted space extends 10,000 feet (1.7 nautical miles). For public or military heliports, the restricted space extends 5,000 feet (0.8 nautical mile).

The nearest public airport to the AEC is the Long Beach Airport, located approximately 3.8 miles to the northwest of the project site. Los Angeles International Airport is approximately 20 miles northwest of the project site and John Wayne Airport is approximately 15 miles to the south of the project site. The Torrance Municipal Airport (14 miles northwest of the site) and the Fullerton Municipal Airport (10 miles northeast of the site) also provide limited air travel within the region. The nearest military airport is the Los Alamitos Army Airfield, which is approximately 2.7 miles northeast of AEC.

In addition to the airports above, there are also three public or private heliports within 2 miles of AEC. For public or private heliports, the restricted space extends 5,000 feet (0.8 nautical mile/0.9 mile) from the heliport. The three heliports, and the distance from the AEC site, are as follows:

- Boeing Seal Beach (Ground Level) Heliport 1.0 mile
- Boeing Seal Beach (Rooftop) Heliport 1.0 mile
- Rockwell Facility Heliport 1.1 miles

All three heliports are more than 0.8 nautical miles from AEC. As part of the analysis for the AEC, a FAA Notice Criteria Tool has been used to determine whether AEC meets Federal Aviation Regulation

77.13 (FAR Section 77.13) requirements regarding the need to notify FAA of AEC construction. Although all structures are well under 200 feet in height, the FAA Notice Criteria Tool indicates that an FAA Form 7460-1, Notice of Proposed Construction or Alteration, needs to be filed with the FAA. The FAA reviewed the Form 7460-1 and issued a Determination of No Hazard to Air Navigation for AEC.

D. Summary of Compliance with Applicable LORS

AEC is expected to comply with the LORS applicable to the project.

E. Summary of the Potential Cumulative Impacts

A cumulative impact refers to a proposed project's incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project.

The project will have a less-than-significant effect on the roadways in the immediate vicinity of the project site and with the exception of one roadway segment, the project's potential impacts to the study roadways are considerably below the City's Level of Service (LOS) D thresholds for city streets and intersections. The project would result in a temporary impact at one study intersection with the construction-added traffic during the morning peak hour (typically 7:00 a.m. to 9:00 a.m.). This is based on a conservative assumption that the construction workforce would arrive at the site during the morning peak hour. AEC construction will take place between the hours of 7:00 a.m. and 7:00 p.m., Monday through Friday, and 9:00 a.m. and 6:00 p.m. on Saturday, consistent with City of Long Beach ordinances. As such, construction workers will not be commuting during the morning peak hours and projected impacts to the Seal Beach Boulevard and PCH intersection will not be significant.

III. Response to Certain Issues Raised in the FSA

No comments on the FSA.

IV. Proposed Licensing Conditions

The Applicant agrees with the Conditions of Certification for Traffic and Transportation (TRANS-1 through TRANS-8) set forth in the FSA, except for one portion of Condition TRANS-3, as explained in further detail below.

The Applicant requested changes to Condition TRANS-3 to limit the scope of the Condition. This Condition requires the Applicant to restore all public roadways damaged due to project-related construction deliveries, which, on the face, is reasonable and appropriate. What is not clear is the scope and method for determining project-related construction damage. Historically, Staff limited the applicability of this type of condition to the construction heavy haul routes and surface streets where the load rate designs may not be as robust as the freeway/highway designs. Furthermore, the practicality of documenting the pre-construction condition of I-405, I-605, and SR 22 in order to determine construction-related impacts from AEC is difficult at best. The FSA Traffic and Transportation Table 4 (One-Way Trips Generated During Construction Period) shows that AEC construction will generate approximately 1,087 average daily trips based on 1,024 construction workers and 63 passenger car equivalent delivery/haul truck trips. As noted in the AEC SAFC, the three nearby freeway/highways have the following average daily vehicles trips:

- I-405 has an average of 369,000 vehicles per day (between Seal Beach Boulevard and I-605)
- I-605 has 162,000 vehicles per day (between its interchange with SR 22 and I-405)
- SR 22 has between 68,000 and 96,000 vehicle trips per day (near Studebaker Road)

The maximum AEC construction trips of 1,087 represent less than 2 percent of the vehicle traffic on SR 22 (assuming the lower daily vehicle trip estimate). However, most of the AEC construction trips are due to commutes by workers driving passenger vehicles (1,024 trips per day) and significant roadway damage is not expected due to these vehicle trips. The construction workers' commutes will incrementally contribute to the overall wear and tear on these roadways, but are not expected to cause potholes, deterioration of pavement edges, or damage to signage. The percentage of AEC construction-related trips on SR 22 due to the delivery/haul truck trips is less than 0.1 percent (about 42 truck trips per day) of the daily vehicle trips (again assuming the lower estimate of daily vehicle trips on SR 22). Assessing the damage from AEC construction-related trips on Interstates and State Routes will be virtually impossible given the relatively small percentage of daily trips AEC construction is expected to generate.

The Applicant proposes the following changes to Condition TRANS-3 to limit the coverage of the Condition to surface roads between the Interstates and State Routes and the project site and the heavy haul route:

> **TRANS-3** Restoration of All Public Roads, Easements, and Rights-of-Way
>
> The project owner shall restore all public roads, easements, rights-of-way, and any other transportation infrastructure damaged due to project-related construction deliveries. Restoration shall be completed in a timely manner to the infrastructure's original condition. Restoration of significant damage which could cause hazards (such as potholes, deterioration of pavement edges, or damaged signage) shall take place immediately after the damage has occurred.
>
> Prior to the start of site mobilization, the project owner shall notify the relevant agencies, including the city of Long Beach, Los Angeles County, and Caltrans, of the proposed schedule for project construction. The purpose of this notification is to request that these agencies consider postponement of any planned public right-of-way repairs or improvement activities in areas affected by project construction until construction is completed, and to coordinate any concurrent construction-related activities that cannot be postponed.
>
> **Verification:** Prior to the start of site mobilization, the project owner shall video~~tape~~ all public roads, easements, right-of-way segment(s), and intersections along the route construction equipment and material delivery vehicles would take**, to and from the freeway and the project site (on surface streets only), and along the heavy haul routes** ~~in the vicinity of the project site~~. The project owner shall provide the video~~tape~~s to the CPM.

Visual Resources

I. Introduction

A. Name: Thomas Priestley

B. Qualifications: The panel's qualifications are as noted in their resumes contained in Appendix A.

C. Prior Filings: In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- CH2M HILL, Alamitos Energy Center (13-AFC-01) Staff Query 2 – Visual Resources (TN #202416), June 3, 2014.
- AES Alamitos Energy, LLC, Supplemental Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #206427-1 through 206427-6 and 206428-1 through 206428-3), October 23, 2015.
- AES Alamitos Energy, LLC, Alamitos Energy Center (13-AFC-01): Removal of Temporary Secondary Construction Access Road (TN #210632), March 7, 2016.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Preliminary Staff Assessment Initial Comments (TN #212487), July 27, 2016.

The facts contained in this testimony (including all referenced documents) are true and correct to the best of my knowledge and belief. To the extent this testimony contains opinions, such opinions reflect my best professional judgment. I make these statements, and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

II. Summary of Testimony

A. Affected Environment

Description of the Visual Setting

The AEC is proposed for development on a 21-acre site within the 71.1-acre AGS property, which is located in Long Beach, California, southeast of the intersection of SR 22 (7th Street) and Studebaker Road.

The area to the north of the AEC site is occupied by a large SCE 230-kV switchyard. The area to the south of the AEC site between Studebaker Road and the San Gabriel River is occupied by the large Plains West Coast Terminals Alamitos Tank Farm petroleum storage facility. Directly to the east of the AEC site, the LADWP Haynes Generating Station stretches a mile along the east bank of the river. The AGS and the LADWP Haynes Generating Station have been generating power in this zone along the river for approximately 60 years. The landscape in this zone is one that is completely dominated by large energy generation and transmission infrastructure, giving it a distinctive character as a landscape of energy. The open marsh lands to the south and to the southwest of the AGS property and the tank farm are historic oil production areas where oil wells continue to operate, reinforcing the role of this zone as an energy production landscape.

Although the area along the San Gabriel River has been long established as a zone for energy production, this has not prevented residential development from taking place in nearby areas. The area across Studebaker Road and the Los Cerritos channel to the west of the AEC site has been developed with single family residential subdivisions, including the area known as University Park Estates, which is located due west of the AEC site. To the immediate east of the LADWP Haynes Generating Station, a

large area between Highway 22 and Westminster Avenue has been developed as Leisure World, a community of single story multi-unit residences for those 55 and older. Recreational activities also take place within and in the vicinity of this power production zone. Bicycle paths that are a part of the San Gabriel River Bike Trail are located on the banks on both sides of the segment of the San Gabriel River that passes between the AGS property and the LADWP Haynes Generating Station. In addition, the west side of the Los Cerritos channel, located across Studebaker Road from the AEC site, has been established as a park strip through which Long Beach Bikeway Route 10 travels.

There are no officially designated state scenic highways near the project. The PCH (Highway 1), located approximately 0.7 mile west at its closest point, is listed as an eligible state scenic highway, but has not been adopted as a part of the state scenic highway system.

A portion of the southernmost portion of the AEC CCGT and the southern lay down area are within the City of Long Beach LCP area, which is implemented pursuant to the California Coastal Act. The LCP has specific requirements related to visual resources that are applicable to portions of the AEC. Policies and requirements related to visual resources in the LCP include those adopted in the City of Long Beach SEADIP Specific Plan.

The AEC site, including the routes of the offsite wastewater pipeline and access road, lie within areas that are designated L (Mixed Use) by the City of Long Beach General Plan, and designed as IG by the SEADIP.

Description of the Project and its Relationship to Existing Features on the AGS Site

The AEC aboveground equipment (CTGs, air-cooled condenser, etc.) will be located within the approximately 21-acre AEC site, which lies within the boundaries of the AGS property. The AEC site includes land that, until recently, was owned by others and was formerly part of the AGS property and used as a tank farm by the original owners, SCE. The tanks were removed in 2010, prior to AES purchasing the site. AES has merged the eastern half of the former tank farm parcel into the larger AGS parcel. Structures on the properties immediately adjacent to the AEC site include the existing SCE switchyard infrastructure to the north and petroleum storage tanks associated with Plains West Coast Terminals Alamitos Tank Farm to the south.

At present, the existing AGS contains six operating generating units with six prominent stacks and massive scaffold-covered boiler structures. The existing stacks are all over 200 feet tall, have a whitewashed appearance, and are unsystematically arranged. Four stacks are tightly oriented along the same line of sight while two stacks are set along a line at right angles to the first four and appear visually separated in the landscape. The massive and visually dominant existing boilers range from 121 to 155 feet in height. The majority of the existing AGS aboveground structures are located along the northern and eastern edges of the site. In contrast, the AEC's stacks will be 140 (combined-cycle) and 80 (simple-cycle) feet tall. Instead of boilers, the AEC combined-cycle units will have an HRSG, which will be significantly smaller than the existing boilers. The AEC's air-cooled condenser will be 104 feet high. A total of four stacks and six transformers (inclusive of auxiliary and CTG step-up transformers) associated with the northern SCGT will be sited in a way that parallels the San Gabriel River.

Two new single-circuit overhead transmission lines will be installed onsite to connect the step-up transformers to the existing SCE 230-kV switchyard. All other linear appurtenances (natural gas and potable water), with the exception of the proposed offsite process/wastewater pipeline, will connect to infrastructure already associated with the AEC.

Construction of the AEC will require the use of laydown areas (approximately 8 acres) dispersed throughout the existing approximately 71.1-acre AGS parcel) and an approximately 10-acre laydown area located adjacent to the south of the existing AGS parcel.

B. Potential Construction and Operational Related Impacts; Avoidance and Minimization Measures

I agree with Staff's conclusion that the AEC would not create substantial adverse impacts under the CEQA Appendix G environmental checklist criteria:

1. The proposed project would not have a substantial adverse effect on a scenic vista.
2. The proposed project would not substantially damage scenic resources.

I also agree with Staff's conclusion regarding CEQA Appendix G environmental checklist criterion 3 that the AEC would not substantially degrade the existing visual character or quality of the site and its surroundings as seen in the views from key observation points (KOPs) 1, 2, and 4.

I disagree with Staff's conclusion that Condition VIS-2 is needed to reduce the visual impacts for the view seen from KOP 3 to a level that is less than significant. As documented in FSA Visual Resources Table 1, AES has specified color treatment and flat/untextured finishes for the surfaces of all major structures. These project features essentially eliminate the visual issues that Staff cites as the basis for concluding that mitigation is required to reduce impacts to a level that is less than significant. Although I conclude that Condition VIS-2 is not needed to mitigate any significant impacts from the AEC, the Applicant does not object to Condition VIS-2.

I disagree with Staff's finding that Conditions VIS-1 and VIS-4 are required to reduce potential impacts from lighting that will be required during the project construction, commissioning, and operational periods to levels that are less than significant. Given the project's location in an area that is already heavily developed with energy generation facilities and the lighting design measures that have been proposed as a part of the project, my assessment is that the project's lighting impacts will be less than significant without Conditions VIS-1 and VIS-4. Although my analysis does not support the need for imposition of Conditions VIS-1 and VIS-4, the Applicant does not object to these Conditions.

My analysis is that no significant visual impacts will result from implementation of the proposed project and that, thus, there is no need to recommend mitigation measures. Staff is recommending four mitigation measures, Conditions VIS-1 through VIS-4. Although my assessment is that these measures are not required to reduce project impacts to levels that are less than significant, the Applicant does not object to these Conditions.

C. Summary of Compliance with Applicable LORS

I agree with Staff that the proposed project would be consistent with all applicable LORS pertaining to aesthetics, or preservation and protection of sensitive visual resources with the effective implementation of the Conditions.

D. Summary of the Potential Cumulative Impacts

I agree with Staff that the incremental effect of the project, combined with the effects of the other projects within the geographic scope identified in the cumulative analysis, would have a less-than-significant cumulative impact on visual resources.

III. Response to Certain Issues Raised in the FSA

No comments on the FSA except as discussed above.

IV. Proposed Licensing Conditions

The Applicant agrees with the Conditions of Certification for Visual Resources (VIS-1 through VIS-4) set forth in the FSA.

Waste Management

I. Introduction

A. Names: Jerry Salamy and Cindy Salazar

B. Qualifications: The panel's qualifications are as noted in their resumes contained in Appendix A.

C. Prior Filings: In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- AES Southland Development, LLC, Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #201620-1 through 201620-72), December 27, 2013.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Data Adequacy Supplement (TN #201751), February 17, 2014.
- CH2M HILL, Alamitos Energy Center (13-AFC-01) Data Response Set 1A – Responses to CEC Staff Data Requests 1-8, 10-12, 16-17, 20-25, 38-44, 51-54, and 59-62 (TN #202381), May 27, 2014.
- AES Alamitos Energy, LLC, Supplemental Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #206427-1 through 206427-6 and 206428-1 through 206428-3), October 23, 2015.
- CH2M HILL, Alamitos Energy Center (13-AFC-01) Supplemental Application for Certification Air Dispersion Modeling Files and Appendix 5.14A – 2015 EMS Phase I ESA Report (TN #206433), October 23, 2015.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Data Responses, Set 6 (Response to Data Requests 83 to 168) (TN #207013), December 14, 2015.
- AES Alamitos Energy, LLC, Alamitos Energy Center (13-AFC-01): Removal of Temporary Secondary Construction Access Road (TN #210632), March 7, 2016.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Preliminary Staff Assessment Initial Comments (TN# 212487), July 27, 2016.

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgment. We make these statements, and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

II. Summary of Testimony

A. Affected Environment

The AEC site is located within the boundaries of the existing and operating AGS. This power plant was formerly owned and operated by SCE. SCE previously operated the plant using both natural gas and fuel oil until 1989, when fuel oil was permanently retired as a fuel source.

The site was previously vacant, undeveloped land possibly used for agricultural purposes prior to construction of the original electrical power generating station in the mid-1950's. The site includes underground fuel-oil pipelines and wastewater retention basins once operated by SCE. Subsurface investigations regarding former SCE operations are ongoing at the site.

The site includes a portion of a former aboveground storage tank (AST) farm referred to as the Tom Dean property in the Phase I Environmental Site Assessment (ESA) conducted consistent with EPA

standards and practices. The purpose of the Phase I ESA was to identify Recognized Environmental Conditions (REC) as defined by the EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312). The Phase I ESA reports concluded that a number of RECs, Historical Recognized Environmental Conditions, and De Minimis Conditions were present at the project site. The onsite RECs include detectable levels of agricultural chemicals, petroleum hydrocarbons, contaminated groundwater impacted by metals, VOCs, and 1,4-dioxane, several underground storage tanks, asbestos, and lead based paint.

B. Potential Construction Related Impacts; Avoidance and Minimization Measures

Both hazardous and non-hazardous waste will be generated during the construction and demolition phases. The primary waste generated will be solid nonhazardous waste. However, some nonhazardous liquid waste and hazardous waste (solid and liquid) will also be generated. Nonhazardous solid waste streams that could be generated include paper, wood, glass, and plastics, concrete, asphalt, and metal. Nonhazardous wastewater will be generated, including sanitary wastewater, equipment washdown water, stormwater runoff, and water from excavation dewatering during construction (if dewatering is required). Depending on the chemical quality of these wastewaters, they could be classified as hazardous or nonhazardous. The wastewaters would be sampled and, if they are hazardous, would be disposed of at an approved facility.

Most of the hazardous waste generated during construction and demolition of the remaining AGS Unit 7 components (hereinafter described as "demolition") will consist of liquid waste, such as flushing and cleaning fluids, passivating fluid (to prepare pipes for use), and solvents. Some hazardous solid waste, such as welding materials and dried paint, may also be generated. The construction contractor will be considered the generator of hazardous construction waste and will be responsible for proper handling of the waste in compliance with all applicable federal, state, and local laws and regulations including licensing, training of personnel, accumulation limits and times, and reporting and record keeping.

C. Potential Operational Related Impacts; Avoidance and Minimization Measures

During AEC operation, the primary waste generated will be nonhazardous waste. However, varying quantities of hazardous waste also will be generated periodically. The types of wastes and their estimated quantities are discussed below.

Nonhazardous Waste. The AEC will produce wastes typical of power generation facility operations and maintenance activities. These will include rags, turbine air filters, broken and rusted metal and machine parts, defective or broken electrical materials, empty containers, the typical refuse generated by workers and small office operations, and other miscellaneous wastes. The quantity of all nonhazardous waste generated during operations is estimated to be about 50 cubic yards per year (approximately 35 tons per year). Large metal parts will be recycled.

Nonhazardous Wastewater. The wastewater collection system will collect sanitary wastewater from sinks, toilets, and other sanitary facilities.

General facility drainage will consist of area washdown, sample drains, equipment leakage, and drainage from facility equipment areas. Water from these areas will be collected in a system of floor drains, hub drains, sumps, and piping, and will be routed to the facility's concrete-lined wastewater sump. Water from this sump will be sampled and analyzed at an approved lab. If contamination is present, the water will be trucked offsite for disposal at an approved wastewater disposal facility. If sampling results show no contamination, the water will be discharged to the stormwater drainage system. The AEC will connect into the existing onsite stormwater system that includes two re-contoured retention basins, with ultimate disposal to the San Gabriel River via existing permitted outfalls.

Process wastewater will be conveyed to the LACSD via a new proposed sewer line interconnection to the LBWD.

Hazardous Waste. Hazardous waste generated will include waste lubricating oil, used oil filters from turbine equipment, spent catalysts, and chemical cleaning wastes. The catalyst units will contain heavy metals that are considered hazardous. Chemical cleaning wastes, which consist of alkaline and acidic cleaning solutions, will be generated from periodic pipe cleaning. These wastes may contain high concentrations of heavy metals and will be collected for offsite disposal.

The chemical feed area drains will collect spillage, tank overflows, effluent from maintenance operations, and liquid from area washdowns. Water collected will be sampled and, if it is not contaminated, released. The quantity of this effluent is expected to be minimal.

D. Summary of Compliance with Applicable LORS

Nonhazardous and hazardous waste handling at the AEC will be governed by applicable federal, state, and local LORS. Applicable LORS address proper waste handling, storage, and disposal practices to protect the environment, facility workers, and the surrounding community.

EPA regulates wastewater under the CWA, though this authority is delegated to the appropriate RWQCB. The federal statute that controls nonhazardous and hazardous waste is the Resource Conservation and Recovery Act (RCRA) 42 U.S. Code Section 6901, et seq. RCRA's implementing regulations are found in 40 CFR Section 260, et seq. Subtitle D assigns responsibility for the regulation of nonhazardous waste to the states; federal involvement is limited to establishing minimum criteria that prescribe the best practicable controls and monitoring requirements for solid waste disposal facilities. Subtitle C controls the generation, transportation, treatment, storage, and disposal of hazardous waste through a comprehensive "cradle-to-grave" system of hazardous waste management techniques and requirements. It applies to all states and to all hazardous waste generators (above certain levels of waste produced). The AEC will conform to this law in its generation, storage, transport, and disposal of any hazardous waste generated at the facility. EPA has delegated its authority for implementing these laws to the appropriate State of California agencies with subject matter expertise.

State LORS

Wastewater is regulated by the SWRCB and RWQCBs under the Porter-Cologne Water Quality Control Act. Nonhazardous waste is regulated by the California Integrated Waste Management Act of 1989, found in PRC Section 40000, et seq. This law provides an integrated statewide system of solid waste management by coordinating state and local efforts in source reduction, recycling, and land disposal safety. Counties are required to submit Integrated Waste Management Plans to the state. This law directly affects Los Angeles County, the City of Long Beach, and the solid waste hauler and disposer that will collect the AEC solid waste.

RCRA allows states to develop their own programs to regulate hazardous waste. The programs must be at least as stringent as RCRA. California has developed its own program in the California Hazardous Waste Control Law (HWCL) (Health and Safety Code Section 25100, et seq.). Because California has elected to develop its own program, the HWCL performs essentially the same regulatory functions as RCRA through the federal delegate agency and is thus the law that will regulate hazardous waste at the AEC. The California HWCL also includes hazardous wastes that are not classified as hazardous waste under RCRA. Because State-regulated hazardous wastes will be generated at the AEC during construction and operation, the HWCL will require the project owner to adhere to State storage, recordkeeping, reporting, and training requirements for these wastes.

Local LORS

For solid nonhazardous waste, the state laws that would normally be administered and enforced primarily by the City of Long Beach Department of Public Works Environmental Services Bureau, City of Long Beach Development Services, and the California RWQCB are administered through the CEC's certified regulatory program. These programs are described below.

The City of Long Beach Department of Health and Human Services, Environmental Health Bureau (Long Beach Environmental Health Bureau) has overall responsibility for Certified Unified Program Agency (CUPA) programs. They are responsible for administering HMBP, Hazardous Materials Management Plans, and Resource Management Plans filed by businesses located in the city. In addition, the Long Beach Environmental Health Bureau ensures that businesses and industry store and use hazardous materials safely and in conformance with various regulatory codes, including LBMC Chapters 8.87 and 8.88. These sections of the municipal code relate to storage, handling, transport, and generation of hazardous materials in the city. The Long Beach Environmental Health Bureau also administers hazardous waste generator and the CalARP programs.

The City of Long Beach Fire Department is the Participating Agency responsible for other CUPA programs, including AST and underground storage tank (UST) permits, and administers the business emergency plan program. The Long Beach Environmental Health Bureau and City of Long Beach Fire Department jointly administer SPCC Plans. The Long Beach Environmental Health Bureau and City of Long Beach Fire Department perform inspections at established facilities to verify that hazardous materials are properly stored and handled and that the types and quantities of materials reported in a firm's HMBP are accurate.

The LBMC Chapter 18.67, Ordinance Number ORD-13-0024, details the construction and demolition (C&D) recycling program (City of Long Beach Planning, 2013).[21] The program requires that at least 60 percent of all material generated on a project must be diverted. No more than 20 percent of the 60 percent diversion rate can be achieved through the recycling or reuse of inert materials, unless an applicant can demonstrate to the satisfaction of the Waste Management Plan Compliance Official that sufficient structural materials do not exist for recycling or that 40 percent diversion of total waste through noninert materials is not feasible (City of Long Beach Planning, 2013). C&D debris may be diverted to an approved mixed use recycling/recovery facility or to other disposal facilities based on the material type and handling method (i.e., recycled, reused, salvaged, disposed or transformed).

All wastes generated by the AEC will be managed in a manner consistent with applicable LORS.

E. Summary of the Potential Cumulative Impacts

The quantities of nonhazardous and hazardous wastes that would be generated during AEC demolition, construction, and operation would be relatively low. Recycling efforts would be prioritized wherever practical, and capacity is available in a variety of treatment and disposal facilities. Sufficient landfill capacity is available in the project area. Therefore, the added waste quantities generated by the AEC would not result in significant cumulative waste management impacts.

III. Response to Certain Issues Raised in the FSA

No comments on the FSA.

IV. Proposed Licensing Conditions

The Applicant agrees with the Conditions of Certification for Waste Management (WASTE-1 through WASTE-9) set forth in the FSA.

[21] City of Long Beach Planning. 2013. City of Long Beach Development Services, Office of Sustainability, Green Building. Available online at: http://www.lbds.info/planning/advance_planning/green_building/default.asp#cd. June.

Water Resources

I. Introduction

A. Names: Matt Franck

B. Qualifications: The panel's qualifications are as noted in their resumes contained in Appendix A.

C. Prior Filings: In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- AES Alamitos Energy, LLC, Supplemental Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #206427-1 through 206427-6 and 206428-1 through 206428-3), October 23, 2015.
- AES Southland Development, Re: Alamitos Energy Center Water Supply Assessment dated January 21, 2016 (TN #210604), March 2, 2016.
- AES Alamitos Energy, LLC, Alamitos Energy Center (13-AFC-01): Removal of Temporary Secondary Construction Access Road (TN #210632), March 7, 2016.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Preliminary Staff Assessment Initial Comments (TN #212487), July 27, 2016.

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of my knowledge and belief. To the extent this testimony contains opinions, such opinions reflect my best professional judgment. I make these statements, and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

II. Summary of Testimony

A. Affected Environment

AES will construct, own, and operate the AEC, a natural-gas-fired, air-cooled, combined-cycle and simple-cycle, electrical generating facility in Long Beach, California. The proposed AEC will have a nominal generating capacity of 1,040 MW. The AEC will be constructed on an approximately 21-acre site located within the larger, 71.1-acre AGS property.

The AEC will use water provided by the LBWD for construction, operational process, and sanitary uses. Process water will be used for the turbine compressor wash, evaporative cooling, HRSG blowdown and makeup water, emergency fire protection, and domestic and sanitary uses. A minimal amount of potable water will be used for sanitary use, drinking, eye wash, safety showers, and fire protection water (less than 1 gallon per minute, as needed). Currently, LBWD supplies the existing AGS with water for process via an existing pipeline interconnection. The project will use the existing LBWD pipeline that enters the site along Studebaker Road for potable water supply. No new offsite water supply pipelines will be required for the project.

The AEC will include a new, 1,000-foot process/sanitary wastewater pipeline to the first point of interconnection with the existing LBWD sewer system. Stormwater runoff from AEC will be directed to existing retention basins and then ultimately discharged to the San Gabriel River via existing outfalls.

The AEC site is outside the 100-year floodplain, in Zone X as defined by the Federal Emergency Management Agency (FEMA). A designation of Zone X means the area is an area of moderate flood hazard, usually the area between the limits of the 100-year and 500-year floods.

The AEC site is adjacent to an area mapped for tsunami susceptibility run-up hazard. Tsunamis are seismically induced ocean waves with very long periods (the duration between waves). Tsunamis may be manifested in the form of wave bores or a gradual upwelling of sea level and can be caused by landslides or earthquakes. The offshore area of Los Angeles County contains many faults and fault scarps capable of producing tsunamis; however, seismically induced sea waves are uncommon. Seven tsunamis have been recorded in California. In southern California, a significant tsunami was associated with the 1960 Chile Earthquake. Damage occurred in the Long Beach–Los Angeles harbor, where 5-foot-high waves surged back and forth in channels, causing damage to small boats and yachts. Tsunami tidal surge occurred in the Long Beach Harbor from the magnitude 8.8 Chile Earthquake in February 2010, and minor effects were reported in the Long Beach Harbor from the March 2011 Japan tsunami.

Seiches are defined as oscillations in confined or semi-confined bodies of water due to earthquake shaking. The AEC site is adjacent to the San Gabriel River channel and within 0.5-mile of an enclosed bay or harbor that could be subject to seiches caused by tsunamis that are captured and reflected within the enclosed area of an inner harbor.

Flooding potential in the project vicinity also may be associated with predicted sea level rise as a result of climate change. The AEC site is approximately 12 to 15 feet above existing mean sea level. The CEC forecasts that by 2030 the mean sea level in southern California could rise between 4 and 30 centimeters (cm), or approximately 1.5 inches to 1 foot, because of climate change. By 2050, the CEC's forecasted mean sea level in southern California may rise by 0.5 meter (approximately 1.5 feet). Additionally, with the predicted rise in sea level, wave-induced storm surges and higher wave run-up may affect coastal areas. The CEC's 2009 report includes a forecast of wave-induced storm surges in California of up to 1.5 meters (approximately 5 feet).

Depending on several factors, the AEC has a projected operational expectancy of approximately 30 years, or until approximately 2050, based on an expected commercial operation date (COD) in 2020. The combination of predicted sea level rise (approximately 1.5 feet) and increased wave-induced storm surges (approximately 5 feet) in southern California could result in an increased depth of inundation in the project area of approximately 6.5 feet from wave-induced storm surges; however, as the AEC site's existing elevation is approximately 12 to 15 feet above existing mean sea level, there would still be a buffer of at least 5.5 feet on the AEC site through its expected operational period.

The design and engineering of the AEC will meet applicable LORS, including those related to flood protection, such as California and federal building code requirements and applicable LORS of the City of Long Beach and Los Angeles County. The design and engineering of the AEC will also address any applicable LORS related to predicted sea level rise, storm surge/wave run-up inundation, and site flooding protection.

LBWD has provided a will-serve letter indicating there is sufficient supply of water to accommodate the project. Water supply alternatives, including the potential use of reclaimed water to support the AEC, were analyzed and determined to be infeasible.

B. Potential Construction Related Impacts; Avoidance and Minimization Measures

The AEC general site grading will establish a working surface for construction and plant operating areas, and will provide positive drainage from buildings and structures. The AEC site grading and drainage will be designed to comply with all applicable LORS. During construction and demolition of the remaining AGS Unit 7 components (hereinafter described as "demolition"), approximately 21 acres of land associated with the AEC will be graded.

Potential surface water impacts are anticipated to be related primarily to short-term construction activity and would consist of increased turbidity from erosion of newly excavated or placed soils. However, complying with engineering and construction specifications and following approved grading

and drainage plans will effectively mitigate these short-term impacts. Furthermore, as required under the General Permit for Discharges of Storm Water Associated with Construction Activity Construction General Permit Order 2009-0009-DWQ (General Construction Permit), a SWPPP will be prepared for the construction site and will include BMPs for erosion and sediment control. The SWPPP will be prepared prior to project construction and demolition to prevent the offsite migration of sediment and other pollutants and to reduce the effects of runoff from the construction site to offsite areas. AEC construction and demolition is not expected to increase the amount of impervious surfaces on the AEC site because of the impervious surfaces already present on the existing AGS property. Implementation of the SWPPP and BMPs will mitigate construction impacts on drainage to a less-than-significant level.

Potential impacts on soil resources during AEC construction and demolition can include increased soil erosion. Soil erosion causes the loss of topsoil and can increase the sediment load in surface water bodies near the construction site. The magnitude, extent, and duration of construction-related impacts depend on the erodibility of the soil; the proximity of the construction activity to the receiving water; and the construction methods, duration, and season.

Because conditions that could lead to excessive soil erosion via water are not present at the AEC site, relatively little soil erosion from rain events is expected during the construction and demolition period. Additionally, construction BMPs will be implemented during AEC construction and demolition in accordance with a site-specific SWPPP that is required under the CWA for all construction projects over one acre in size. The CEC also requires project owners to develop and implement a drainage, erosion, and sediment control plan (DESCP) to reduce the impact of runoff from the construction site. Monitoring will involve inspections to ensure that the BMPs described in the SWPPP and DESCP are properly implemented and effective. Therefore, impacts from soil erosion via water are expected to be less than significant.

Water Quality. Potential construction-related water quality impacts include impacts on surface water runoff during excavation and construction. Additionally, construction materials could contaminate runoff or groundwater if not properly stored and used. Such construction impacts will be less than significant with implementation of a SWPPP and associated BMPs, including practicing proper housekeeping at the construction site. A SWPPP is required under the General Permit for Stormwater Discharges Associated with Construction Activity for projects resulting in one or more acres of soil disturbance. SWPPP procedures include submitting a Notice of Intent (NOI) to the Los Angeles RWQCB and developing the SWPPP prior to the start of construction activities.

Potential surface water quality impacts are anticipated to be related primarily to short-term construction activity and would consist of increased turbidity from erosion of newly excavated or placed soils. However, complying with engineering and construction specifications and following approved grading and drainage plans will effectively mitigate these short-term potential impacts. Furthermore, as required under the General Construction Permit, a SWPPP will be prepared for the construction site and will include BMPs for erosion and sediment control. The SWPPP will be prepared prior to construction of the AEC to prevent the offsite migration of sediment and other pollutants and to reduce the effects of runoff from the construction site to offsite areas. Implementation of the SWPPP and BMPs will mitigate construction impacts on water quality to a less-than-significant level.

Water used for dust control and soil compaction during AEC construction will not result in discharge because only a minimal amount of water will be used for this purpose. Therefore, no impact on water quality would occur as a result of dust control and soil compaction during construction. During the construction period, sanitary waste will be collected in portable toilets supplied by a licensed contractor for collection and disposal at an appropriate receiving facility resulting in no onsite discharge. Equipment wash water will be collected and disposed of offsite. With the implementation of the SWPPP and BMPs, construction effects on water quality are less than significant.

It is expected that the construction laydown and construction worker parking areas that are not already graveled or paved will be covered by gravel or paving immediately after site preparation to prevent subsequent wind erosion losses.

C. Potential Operational Related Impacts; Avoidance and Minimization Measures

The AEC site is currently developed with many impervious surfaces. Stormwater runoff from the site will be captured by a stormwater drainage system, which includes the use of an existing retention pond, and discharged to the San Gabriel River outfall. AEC construction is not expected to increase the amount of impervious surfaces onsite. Because stormwater would be collected and discharged via a stormwater drainage system and outfall, the AEC would not result in substantial erosion, siltation, or flooding onsite or offsite. Therefore, operational impacts on drainage patterns are less than significant.

Water Quality/Waste Discharge Requirements. Process and sanitary wastewater from the AEC will be discharged to the LBWD sanitary system and conveyed to LACSD facilities for treatment and ultimate disposal. AEC wastewater discharge quality will comply with the narrative and numeric standard required by the LACSD Wastewater Ordinance and the City of Long Beach rules and regulations. As a customer of LBWD, the AEC will not violate any waste discharge requirements (WDRs) and will not negatively affect water quality.

Stormwater runoff from the building roofs and parking areas will be collected and ultimately discharged to the San Gabriel River. No impact on the quantity of impervious surface as a result of AEC construction is expected. However, if the new/replaced impervious surface area is greater than 50 percent of the total project area, pretreatment will be required. Potential stormwater quality impacts during operation include discharge of heavy metals (e.g., brake dust) and oil and grease from parking areas. These impacts will be less than significant with implementation of an Industrial SWPPP and associated BMPs, including practicing proper housekeeping at the site. A SWPPP is required under the General Permit for Stormwater Discharges Associated with Industrial Activity for steam-electric power plant projects. SWPPP procedures include submitting an NOI to the SWRCB and developing the Industrial SWPPP prior to the start of operations. The AEC includes oil/water separators to treat the stormwater.

Groundwater. The AEC will not pump groundwater and will have no effect on groundwater quantity or quality.

Flooding Potential. The AEC site is not in the 100-year floodplain as defined by FEMA. Therefore, project implementation will not result in any structures that will impede or redirect flood flows and no impacts will occur.

The AEC site is adjacent to an area mapped for tsunami susceptibility run-up hazard and is adjacent to a river channel and within 0.5 mile of an enclosed bay or harbor that could be subject to seiches caused by tsunamis. Although the offshore area of Los Angeles County contains many faults and fault scarps capable of producing tsunamis, seismically induced sea waves are uncommon. Therefore, inundation by tsunami or seiche, while possible, is unlikely and project implementation would not increase the potential for inundation.

The combination of predicted sea level rise (approximately 1.5 feet) and increased wave-induced storm surges (approximately 5 feet) in southern California potentially could result in an increased depth of inundation in the vicinity of the AEC site of approximately 6.5 feet from wave-induced storm surges; however, because the site's existing elevation is approximately 12 to 15 feet above existing mean sea level, there would still be a buffer of at least 5.5 feet on the AEC site through its expected operational period of approximately 2050.

To provide adequate flood protection that incorporates predicted sea level rise, the design and engineering of the AEC will meet applicable LORS, including those related to flood protection, California and federal building code requirements, and applicable LORS of the City of Long Beach and Los Angeles

County. The design and engineering will address any applicable LORS related to sea level rise, storm surge/wave run-up inundation, and site flooding protection. Therefore, flooding caused by sea level rise is unlikely, and no adverse impacts will occur as a result of project implementation.

D. Summary of Compliance with Applicable LORS

In California, discharges of wastewater and stormwater to surface waters are regulated by the SWRCB and RWQCBs pursuant to the CWA and the Porter-Cologne Water Quality Control Act. Relevant NPDES permits for industrial discharges and stormwater quality management are discussed under state LORS.

State LORS

California Ocean Plan. The SWRCB formulates and adopts a water quality control plan for California ocean waters. The 2009 California Ocean Plan regulates waste discharges, effluent discharges, and discharge locations. The plan sets specific narrative and numeric water quality objectives for bacteriological, physical, and chemical characteristics. The plan applies to both point and nonpoint source discharges. The water quality objectives from the 2009 California Ocean Plan (or as updated) will be met by the AEC, which will be demonstrated when a new NPDES permit is approved prior to the start of AEC operations.

Statewide Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling. The SWRCB established technology-based standards to implement federal CWA Section 316(b), which requires that the location, design, construction, and capacity of cooling intake structures reflect the best technology available for minimizing adverse environmental impact. An implementation plan has been submitted pursuant to the requirements of the Once-Through Cooling Policy.

Construction Stormwater NPDES Permit. The federal CWA effectively prohibits discharges of stormwater from construction sites unless the discharge is in compliance with an NPDES permit. The SWRCB is the permitting authority in California and has adopted a statewide General Permit for Stormwater Discharges Associated with Construction Activity (SWRCB Order 2009-0009-DWQ) that applies to projects resulting in one acre or more of soil disturbance. The AEC would result in disturbance of more than one acre of soil. Therefore, the AEC will require the preparation of a construction SWPPP that would specify site management activities to be implemented during site development. These management activities will include construction stormwater BMPs, dewatering runoff controls, and construction equipment decontamination. The Los Angeles RWQCB requires an NOI to be filed prior to any stormwater discharge from construction activities and that the SWPPP be implemented and maintained onsite. A DESCP/SWPPP will be completed prior to the start of construction activities.

Industrial Stormwater NPDES Permit. The SWRCB implements regulations under the federal CWA requiring that point source discharges of stormwater (which is a flow of rainfall runoff in some kind of discrete conveyance such as a pipe, ditch, channel, or swale) associated with industrial activity that discharges either directly to surface waters or indirectly through municipal separate storm sewers must be regulated by an NPDES permit. The SWRCB has issued WDRs for discharges of stormwater associated with industrial activities (SWRCB Order 2014-0057-DWQ), excluding construction activities.

California Water Code Sections 10910 – 10915. Pursuant to Senate Bill 610 (enacted in 1995), the California Water Code requires public water systems to prepare a water supply assessment (WSA) for certain defined development projects. Lead agencies determine, based on the WSA, whether protected water supplies will be sufficient to meet project demands along with the region's reasonably foreseeable cumulative demand under normal-year, single dry-year, and multiple dry-year conditions.

The WSA provisions apply to projects as defined in Water Code Section 10912, including: (1) industrial, manufacturing, or processing plants that would house more than 1,000 persons, occupy more than 40 acres of land, or have more than 650,000 square feet of floor area; and (2) projects that would demand an amount of water equivalent to that required by a 500 dwelling unit project.

The LBWD prepared and the board approved a WSA which concludes that sufficient potable water is available to supply AEC under multiple dry-year conditions.

E. Summary of the Potential Cumulative Impacts

A cumulative impact refers to a proposed project's incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project.

As required under the General Permit for Stormwater Discharges Associated with Construction Activity, a SWPPP will be prepared for the AEC and will include BMPs for erosion and sediment control. Implementation of the SWPPP and BMPs will prevent the offsite migration of sediment and other pollutants and reduce runoff from the construction site to offsite areas. Therefore, the AEC would be very unlikely to cause cumulative impacts when its effects are considered in combination with those of other construction projects.

The AEC would have little or no adverse impact on water quality or WDRs, sanitary waste discharge capacity, flooding potential, or groundwater resources. Therefore, the project would be very unlikely to cause cumulative impacts when its effects are considered in combination with those of other projects.

III. Response to Certain Issues Raised in the FSA

Condition Soil&Water-1 describes the processes for stormwater permitting for the construction phase. This construction-related condition is acceptable.

As for project operations, proposed Condition Soil&Water-4 should be revised to reflect the need for the project to secure an operational stormwater permit from the Los Angeles RWQCB through the NOI process, sometimes referred to as the statewide Industrial General Permit. The revisions will address stormwater issues. With respect to industrial wastewater discharges, as described above, the AEC will discharge industrial process wastewater to the City of Long Beach sewer system. Given this direct discharge to the existing industrial sewer system, no site-specific NPDES permit is required for industrial discharges associated with operations of the AEC. The timing for securing the operational permits should be prior to commencement of commercial operations, not during construction or site mobilization. The Applicant's proposed revisions to Condition Soil&Water-4 reflect these facts.

IV. Proposed Licensing Conditions

For the reasons described above, proposed Condition Soil&Water-4 should be revised as follows:

> **SOIL&WATER-4:** Prior to ~~site mobilization~~**the start of commercial operations**, the project owner shall ~~obtain a~~ **provide evidence of obtaining certification (Notice of Intent) under the statewide** National Pollutant Discharge Elimination System permit for ~~industrial waste and~~ stormwater discharge**s associated with industrial activities** ~~to the San Gabriel River~~. ~~The project owner shall discharge to the same outfall currently utilized by the Alamitos Generating Station under the requirements of Order No. R4-2000-0082, NPDES No. CA0001139.~~ **The project owner also shall provide evidence that the City of Long Beach has issued a sewer connection permit for industrial waste discharges.** The project owner shall provide a copy of all permit documentation sent to the Los Angeles **RWQCB,** ~~or~~ State Water Board or **City of Long Beach** to the CPM and notify the CPM in writing of any reported non-compliance.
>
> **Verification:** Prior to ~~site mobilization~~**the start of commercial operations**, the project owner shall submit to the CPM documentation that all necessary NPDES permits were obtained from the Los Angeles **RWQCB** or State Water Board. Thirty days prior to ~~project commissioning~~ **the start of commercial operations**, the project owner shall submit to the CPM a copy of the

~~Industrial Speci~~**Long Beach sewer connection permit for industrial waste discharge**. ~~The project owner shall submit to the CPM all copies of any relevant correspondence between the project owner and the Board regarding NPDES permits in the annual compliance report.~~

Worker Health and Safety

I. Introduction

A. Names: Jerry Salamy

B. Qualifications: The panel's qualifications are as noted in their resumes contained in Appendix A.

C. Prior Filings: In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Data Responses, Set 2 (Responses to Data Requests 64 to 68) (TN #202867), August 1, 2014.
- AES Alamitos Energy, LLC, Supplemental Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #206427-1 through 206427-6 and 206428-1 through 206428-3), October 23, 2015.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Data Responses, Set 6 (Response to Data Requests 83 to 168) (TN #207013), December 14, 2015.
- AES Alamitos Energy, LLC, Alamitos Energy Center (13-AFC-01): Removal of Temporary Secondary Construction Access Road (TN #210632), March 7, 2016.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Preliminary Staff Assessment Initial Comments (TN #212487), July 27, 2016.

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of my knowledge and belief. To the extent this testimony contains opinions, such opinions reflect my best professional judgment. I make these statements, and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

II. Summary of Testimony

A. Affected Environment

The proposed AEC will be constructed on an approximately 21-acre site within the larger 71.1-acre property of the existing AGS. This site is located in an industrial-zoned area within Long Beach, California. The remaining components of AGS Unit 7 equipment and facilities within the AEC site footprint will be demolished as part of the project (hereinafter described as "demolition").

During this project, the workers will be exposed to potential demolition, construction, and operation safety hazards. An analysis has been prepared to evaluate the project hazards and control measures. The analysis identifies the hazards anticipated during construction and operation and indicates which safety programs should be developed and implemented to mitigate and appropriately manage those hazards. Construction and operation of the project will be conducted in accordance with all applicable federal, state and local LORS relating to worker health and safety.

B. Potential Construction Related Impacts; Avoidance and Minimization Measures

Health and Safety programs are overall plans that set forth the method or methods that will be followed to achieve particular health and safety objectives. For example, the Fire Protection and Prevention Program will describe appropriate procedures and plans to protect against and prevent fires, including equipment required, such as firefighting equipment, and procedures to protect against fires. The Emergency Action Program/Plan will describe: escape procedures, including, for example, responses to

potential tsunami inundation; rescue and medical procedures; alarm and communication systems; and response procedures for very hazardous materials that can migrate. The programs or plans are contained in written documents and contain training requirements that are translated into detailed training courses.

C. Potential Operational Related Impacts; Avoidance and Minimization Measures

Upon completion of construction and commencement of operations, the construction safety and health program will transition into an operations-oriented program reflecting the hazards and controls necessary during operation.

To ensure that employees recognize and understand how to protect themselves from potential hazards, comprehensive training programs will be implemented. Each of the safety procedures developed to control and mitigate potential site hazards will require some form of training. Training will be delivered in various ways, depending on the requirements of Cal-OSHA standards, the complexity of the topic, the characteristics of the workforce, and the degree of risk associated with each of the identified hazards.

D. Summary of Compliance with Applicable LORS

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

LORS	Requirements/Applicability	Administering Agency
Federal		
Title 29 CFR Part 1910	Contains the minimum occupational safety and health standards for general industry in the U.S.	OSHA
Title 29 CFR Part 1926	Contains the minimum occupational safety and health standards for the construction industry in the U.S.	OSHA
State		
California Occupational Safety and Health Act, 1970	Establishes minimum safety and health standards for construction and general industry operations in California	Cal-OSHA
8 CCR § 339	Requires a list of hazardous chemicals relating to the Hazardous Substance Information and Training Act	Cal-OSHA
8 CCR § 450	Addresses hazards associated with pressurized vessels	Cal-OSHA
8 CCR § 750	Addresses hazards associated with high-pressure steam	Cal-OSHA
8 CCR § 1509	Addresses requirements for construction, accident, and prevention plans	Cal-OSHA
8 CCR § 1509, et seq., and § 1684, et seq.	Addresses construction hazards, including head, hand, and foot injuries and noise and electrical shock	Cal-OSHA
8 CCR § 1528, et seq., and 3380, et seq.	Requirements for PPE	Cal-OSHA
8 CCR § 1532, and § 5206	Addresses Chromium IV (Hexavalent Chromium)	Cal-OSHA

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

LORS	Requirements/Applicability	Administering Agency
8 CCR § 1597, et seq., and § 1590, et seq.	Requirements addressing the hazards associated with traffic accidents and earth-moving	Cal-OSHA
8 CCR § 1604, et seq.	Requirements for construction hoist equipment	Cal-OSHA
8 CCR § 1620, et seq., and 1723, et seq.	Addresses miscellaneous hazards	Cal-OSHA
8 CCR § 1709, et seq.	Requirements for steel reinforcing, concrete pouring, and structural steel erection operations	Cal-OSHA
8 CCR § 1920, et seq.	Requirements for fire protection systems	Cal-OSHA
8 CCR § 2300, et seq., and § 2320, et seq.	Requirements for addressing low-voltage electrical hazards	Cal-OSHA
8 CCR § 2395, et seq.	Addresses electrical installation requirements	Cal-OSHA
8 CCR § 2700, et seq.	Addresses high-voltage electrical hazards	Cal-OSHA
8 CCR § 3200, et seq., and § 5139, et seq.	Requirements for control of hazardous substances	Cal-OSHA
8 CCR § 3203, et seq.	Requirements for operational accident prevention programs	Cal-OSHA
8 CCR 3§ 270, et seq., and § 3209, et seq.	Requirements for evacuation plans and procedures	Cal-OSHA
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	Cal-OSHA
8 CCR § 3360, et seq.	Addresses requirements for sanitary conditions	Cal-OSHA
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	Cal-OSHA
8 CCR § 3649, et seq., and § 3700, et seq.	Requirements for addressing hazards associated with field vehicles	Cal-OSHA
8 CCR § 3940, et seq.	Requirements for addressing hazards associated with power transmission, compressed air, and gas equipment	Cal-OSHA
8 CCR § 5109, et seq.	Requirements for addressing construction accident and prevention programs	Cal-OSHA
8 CCR § 5110, et seq.	Requirements for the implementation of an ergonomics program	Cal-OSHA

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

LORS	Requirements/Applicability	Administering Agency
8 CCR § 5139, et seq.	Requirements for addressing hazards associated with welding, sandblasting, grinding, and spray-coating	Cal-OSHA
8 CCR § 5150, et seq.	Requirements for confined space entry	Cal-OSHA
8 CCR § 5155, et seq.	Requirements for use of respirators and for controlling employee exposure to airborne contaminants	Cal-OSHA
8 CCR § 5160, et seq.	Requirements for addressing hot, flammable, poisonous, corrosive, and irritant substances	Cal-OSHA
8 CCR § 5192, et seq.	Requirements for conducting emergency response operations	Cal-OSHA
8 CCR § 5193, et seq.	Requirements for controlling employee exposure to blood-borne pathogens associated with exposure to raw sewage water and body fluids associated with first aid/CPR duties	Cal-OSHA
8 CCR § 5194, et seq.	Requirements for employee exposure to dusts, fumes, mists, vapors, and gases	Cal-OSHA
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	Cal-OSHA
8 CCR § 5583, et seq.	Requirements for design, construction, and installation of venting, diking, valving, and supports	Cal-OSHA
8 CCR § 6150, et seq.; § 6151, et seq.; § 6165, et seq.; 6170, et seq.; and § 6175, et seq.	Fire protection requirements	Cal-OSHA
Title 24, Part 3, California Electrical Code	The Cal-OSHA electrical safety regulations incorporate the requirements of the Uniform Electrical Code located in Title 24, Part 3	Cal-OSHA
8 CCR, Part 6	Provides health and safety requirements for working with tanks and boilers	Cal-OSHA
Health and Safety Code Section 25531, 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 regulated materials prepare and maintain an RMP	Cal-OSHA
Health and Safety Code Sections 25500 through 25541	Requires the preparation of an HMBP that details emergency response plans for a hazardous materials emergency at the facility	Cal-OSHA

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

LORS	Requirements/Applicability	Administering Agency
Local		
LBMC, Title 18, Chapter 18.48.240 and 18.48.580	Requirements pertaining to the storage, handling, transport, and generation of hazardous waste	Long Beach Fire Department
Business Plan	Provides response agency with overview of the AEC's purpose and operations	CUPA, administered by the Long Beach Fire Department
National Standards		
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 needed by emergency response personnel	Long Beach Fire Department
NFPA 10, Standard for Portable Fire Extinguishers	Requirements for selection, placement, inspection, maintenance, and employee training for portable fire extinguishers	Long Beach Fire Department
NFPA 11, Standard for Low-Expansion Foam and Combined Agent Systems	Requirements for installation and use of low-expansion foam and combined-agent systems	Long Beach Fire Department
NFPA 11A, Standard for Medium- and High- Expansion Foam Systems	Requirements for installation and use of medium- and high-expansion foam systems	Long Beach Fire Department
NFPA 12, Standard on Carbon Dioxide Extinguishing Systems	Requirements for installation and use of carbon dioxide extinguishing systems	Long Beach Fire Department
NFPA 13, Standard for Installation of Sprinkler Systems	Guidelines for selection and installation of fire sprinkler systems	Long Beach Fire Department
NFPA 13A, Recommended Practice for the Inspection, Testing, and Maintenance of Sprinkler Systems	Guidance for inspection, testing, and maintenance of sprinkler systems	Long Beach Fire Department
NFPA 14, Standard for the Installation of Standpipe and Hose Systems	Guidelines for selection and installation of standpipe and hose systems	Long Beach Fire Department
NFPA 15, Standard for Water Spray Fixed Systems	Guidelines for selection and installation of water spray fixed systems	Long Beach Fire Department
NFPA 17, Standard for Dry Chemical Extinguishing Systems	Guidance for selection and use of dry chemical extinguishing systems	Long Beach Fire Department
NFPA 20, Standard for the Installation of Centrifugal Fire Pumps	Guidance for selection and installation of centrifugal fire pumps	Long Beach Fire Department
NFPA 22, Standard for Water Tanks for Private Fire Protection	Requirements for water tanks for private fire protection	Long Beach Fire Department
NFPA 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances	Requirements for private fire service mains and their appurtenances	Long Beach Fire Department
NFPA 26, Recommended Practice for the Supervision of Valves Controlling Water Supplies	Supervision guidance for valves controlling water supplies	Long Beach Fire Department

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

LORS	Requirements/Applicability	Administering Agency
NFPA 30, Flammable and Combustible Liquid Code	Requirements for storage and use of flammable and combustible liquids	Long Beach Fire Department
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	Long Beach Fire Department
NFPA 50A, Standard for Gaseous Hydrogen Systems at Consumer Sites	Fire protection requirements for hydrogen systems	Long Beach Fire Department
NFPA 54, National Fuel Gas Code	Fire protection requirements for use of fuel gases	Long Beach Fire Department
NFPA 59A, Standard for the Storage and Handling of Liquefied Petroleum Gases	Requirements for storage and handling of liquefied petroleum gases	Long Beach Fire Department
NFPA 68, Guide for Explosion Venting	Guidance in design of facilities for explosion venting	Long Beach Fire Department
NFPA 70, National Electric Code	Guidance on safe selection and design, installation, maintenance, and construction of electrical systems	Long Beach Fire Department
NFPA 70B, Recommended Practice for Electrical Equipment Maintenance	Guidance on electrical equipment maintenance	Long Beach Fire Department
NFPA 70E, Standard for Electrical Safety Requirements for Employee Workplaces	Employee safety requirements for working with electrical equipment	Long Beach Fire Department
NFPA 71, Standard for the Installation, Maintenance, and Use of Central Station Signaling Systems	Requirements for installation, maintenance, and use of central station signaling systems	Long Beach Fire Department
NFPA 72A, 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	Long Beach Fire Department
NFPA 72E, Standard on Automatic Fire Detection	Requirements for automatic fire detection	Long Beach Fire Department
NFPA 72F, Standard for the Installation, Maintenance, and Use of Emergency Voice/Alarm of Communication Systems	Requirements for installation, maintenance, and use of emergency and alarm communications systems	Long Beach Fire Department
NFPA 72H, Guide for Testing Procedures for Local, Auxiliary, Remote Station, and Proprietary Protective Signaling Systems	Testing procedures for types of signaling systems anticipated for facility	Long Beach Fire Department
NFPA 75, Standard for the Protection of Electronic Computer/Data Processing Equipment	Requirements for fire protection systems used to protect computer systems	Long Beach Fire Department
NFPA 78, Lightning Protection Code	Lightning protection requirements	Long Beach Fire Department
NFPA 80, Standard for Fire Doors and Windows	Requirements for fire doors and windows	Long Beach Fire Department
NFPA 90A, Standard for the Installation of Air Conditioning and Ventilating Systems	Requirements for installation of air conditioning and ventilating systems	Long Beach Fire Department

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

LORS	Requirements/Applicability	Administering Agency
NFPA 101, Code for Safety to Life from Fire in Buildings and Structures	Requirements for design of means of exiting the facility	Long Beach Fire Department
NFPA 291, Recommended Practice for Fire Flow Testing and Marking of Hydrants	Guidelines for testing and marking of fire hydrants	Long Beach Fire Department
NFPA 850, Recommended Practice for Fire Protection for Fossil Fuel Steam Electric Generating Plants	Requirements for fire protection in fossil-fuel steam electric generating plants	Long Beach Fire Department
NFPA 1961, Standard for Fire Hose	Specifications for fire hoses	Long Beach Fire Department
NFPA 1962, Standard for the Care, Maintenance, and Use of Fire Hose Including Connections and Nozzles	Requirements for care, maintenance, and use of fire hoses	Long Beach Fire Department
NFPA 1963, Standard for Screw Threads and Gaskets for Fire Hose Connections	Specifications for fire hose connections	Long Beach Fire Department
ANSI/ASME, Boiler and Pressure Vessel Code	Specifications and requirements for pressure vessels	N/A
ANSI, B31.2, Fuel Gas Piping	Specifications and requirements for fuel gas piping	N/A

ANSI = American National Standards Institute

ASME = American Society of Mechanical Engineers

CCR = California Code of Regulations

CPR = cardiopulmonary resuscitation

N/A = Not applicable

OSHA = U.S. Occupational Safety and Health Administration

PPE = personal protective equipment

III. Response to Certain Issues Raised in the FSA

No comments on the FSA.

V. Proposed Licensing Conditions

The FSA for the project proposes eight Conditions of Certification for this subject matter. We agree with the Conditions of Certification set forth in the FSA pertaining to this subject, except as set forth below.

Proposed Revisions to CONDITION Worker Safety-8

The language contained in Condition Worker Safety-8 implies that the NFPA and CFR are applicable to AEC, which is not the case. To avoid the perception that these standards/regulations apply to AEC, the following revisions to Condition Worker Safety-8 are proposed:

> **WORKER SAFETY-8** The project owner shall ensure that the natural gas compressor buildings at the Alamitos Energy Center **are designed consistent with the requirements of** ~~shall comply with~~ **the** NFPA ~~requirements~~ for compressor enclosures and ~~that it shall also comply with the requirements set forth in~~ **Title** 40 CFR **Part** 192 Sections 163 through 173 and sections 731 through 736 regarding fire and explosion protection systems. All documentation of plans for the compressor enclosure shall be submitted to the CPM for review and approval.

Verification: At least 60 days prior to the start of construction of the natural gas compressor building the project owner shall submit to the LBFD for review and comment, and to the CPM for review and approval, documentation of plans for the compressor enclosure at the Alamitos Energy Center demonstrating compliance with the condition described above.

Alternatives

I. Introduction

A. Names: Stephen O'Kane and Jerry Salamy

B. Qualifications: The panel's qualifications are as noted in their resumes contained in Appendix A.

C. Prior Filings: In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- AES Alamitos Energy, LLC, Supplemental Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #206427-1 through 206427-6 and 206428-1 through 206428-3), October 23, 2015.
- AES Alamitos Energy, LLC, Alamitos Energy Center (13-AFC-01): Removal of Temporary Secondary Construction Access Road (TN #210632), March 7, 2016.

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgment. We make these statements, and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

II. Summary of Testimony

The AEC will have a nominal generating capacity of 1,040 MW and will be constructed on an approximately 21-acre site within the boundaries of the 71.1-acre AGS property in Long Beach, California.

A reasonable range of alternatives were analyzed for the AEC, include a "no project" alternative, power plant site alternatives, alternative design features, alternative generating technologies, alternative emission control technologies, alternative water supplies, alternative cooling technologies, alternative fuel supplies, and alternative wastewater disposal methods. These alternatives are discussed in relation to the environmental, public policy, and business considerations involved in developing the project. The alternative analysis evaluated reasonable alternatives to the AEC that could feasibly attain most of the project objectives and reduce or eliminate any significant effects of the project. As the project is not expected to result in any significant environmental impacts, the preferred alternative is the AEC.

A. Potential Construction Related Impacts; Avoidance and Minimization Measures

No significant, unmitigated construction related impacts are expected.

B. Potential Operational Related Impacts; Avoidance and Minimization Measures

No significant, unmitigated operational related impacts are expected.

C. Summary of Compliance with Applicable LORS

The AEC is expected to comply with applicable LORS.

D. Summary of the Potential Cumulative Impacts

No significant, unmitigated cumulative impacts are expected.

III. Response to Certain Issues Raised in the FSA

No comments on the FSA.

IV. Proposed Licensing Conditions

No Conditions of Certification are proposed for Alternatives.

Compliance

I. Introduction

A. Names: Stephen O'Kane and Jerry Salamy
B. Qualifications: The panel's qualifications are as noted in their resumes contained in Appendix A.
C. Prior Filings: In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- AES Southland Development, LLC, Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #201620-1 through #201620-72), December 27, 2013.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Data Adequacy Supplement (TN #201751), February 17, 2014.
- CH2M HILL, Alamitos Energy Center (13-AFC-01) Data Response Set 1A – Responses to CEC Staff Data Requests 1-8, 10-12, 16-17, 20-25, 38-44, 51-54, and 59-62 (TN #202381), May 27, 2014.
- AES Alamitos Energy, LLC, Supplemental Application for Certification, Alamitos Energy Center, Volumes 1 and 2 (13-AFC-01) (TN #206427-1 through 206427-6 and 206428-1 through 206428-3), October 23, 2015.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Preliminary Staff Assessment Initial Comments (TN #212487), July 27, 2016.
- AES Southland Development, LLC, Alamitos Energy Center (13-AFC-01) Preliminary Staff Assessment Summary of PSA Workshop and Supplemental Comments (TN # 212771), August 12, 2016.

All of the facts contained in this testimony (including all referenced documents) are true and correct, to the best of our knowledge. To the extent this testimony contains opinions, such opinions reflect my best professional judgement. We make these statements, and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

II. Summary of Testimony

The Applicant's detailed description of the AEC in the Applicant's Project Description testimony is hereby incorporated by reference.

III. Response to Certain Issues Raised in the FSA

The Applicant provided detailed comments on certain Compliance Conditions proposed in the PSA. In response to the Applicant's PSA comments, the FSA revised several of the Compliance Conditions. However, there are still a number of problems with Conditions COM-13, COM-14, and COM-15 that the FSA revisions did not address.

For Condition COM-13, the FSA revised section (a)(1) removed some of the specific reporting language. However, the revised language in the FSA continues to provide reporting requirements for operational issues unrelated to any potentially significant environmental effects or LORS compliance. The Applicant has reviewed portions of the recently published FSA for the Huntington Beach Energy Project (HBEP) and agrees with the deletion of what was Section (a)(1) of Condition COM-13 in the HBEP PSA. The Applicant supports a similar deletion of Section (a)(1) of the AEC's FSA language, as shown below. In addition, the HBEP FSA proposes a new and renumbered Section (a)(1), which is acceptable to the Applicant with a slight modification to further clarify what type of "outage" requires notification under the new Section

(a)(1). Specifically, the Applicant suggests that the new Section (a)(1) of Condition COM-13 be revised to use the term "Forced Outage" as defined in the CAISO tariff. The proposed revision to Section 13(a)(1) of Condition COM-13 is set forth below.

Similarly, Condition COM-14 attempts to impose substantial noticing and reporting requirements for non-operations and "repairs." Fortunately, routine maintenance is excluded. However, it is unclear what problem these wholly new requirements are attempting to solve. The burdens imposed are not related to any potentially significant impacts or LORS compliance and thus should be removed.

Finally, Condition COM-15 imposes new facility closure obligations that are at this time speculative. Rather than speculating today, facility closures in the future should be governed by the then-existing LORS.

The Applicant suggests that these facility closures and related matter should be revised. Conditions COM-13, COM-14, and COM-15 should be revised to be consistent with both CEC precedents in other siting cases and with what is knowable today about events that will, by definition, occur in the future. Therefore, the Applicant recommends revisions to Condition 13(a)(1) and continues to recommend revisions to Conditions COM-14 and COM-15, as set forth in the Applicant's pre- and post-workshop comments on the PSA (TN #212487 and TN #212771).

IV. Proposed Licensing Conditions

A. Section (a)(1) of Condition COM-13 should be revised, as follows:

COM-13 Incident-Reporting Requirements. (a) The project owner shall notify the CPM within one hour after it is safe and feasible of any incident at the facility that results in any of the following:

1. ~~an event of any kind occurs that causes an unplanned turn-down of ongoing power delivery to the electrical grid such that the turn-down is of sufficient magnitude that CAISO notification is required;~~**an event of any kind that causes a "Forced Outage" as defined in the CAISO tariff;**

2. the activation of onsite emergency fire suppression equipment to combat a fire; * * *

B. Condition COM-14 should be replaced in its entirety, as follows:

COM-14 Facility Closure Planning. To ensure that when a facility ceases operations, temporarily or permanently, that it does so safely and in conformance with all applicable laws, the project owner shall coordinate with the Energy Commission to plan and prepare for such events.

Unplanned temporary closure occurs when the facility ceases operations suddenly or unexpectedly, but at the time of closure the project owner expects or intends that the closure will be temporary. Unplanned permanent closure occurs when the facility ceases operations suddenly or unexpectedly, but at the time of closure the project owner intends or expects that the closure will be permanent.

A. In the event that the project ceases operations suddenly or unexpectedly and the project owner expects the facility to be out of operation for more than 7 days, the project owner shall notify the CPM as soon as practicable after the project ceases operations and no later than one week from the date the project ceases operations.

B. Within 7 days after the project owner informs the CPM of any unplanned temporary closure, the project owner shall provide a report to the CPM with a plan for conducting the activities necessary to restore the facility to operations. If

nonoperation is due to an unplanned incident, temporary repairs and/or corrective actions may be undertaken before the plan is submitted. The plan shall include:

1. **Identification of operational and non-operational components of the plant;**
2. **A detailed description of the repair and inspection or restoration activities;**
3. **A proposed schedule for completing the repair and inspection or restoration activities;**
4. **An assessment of whether or not the proposed activities will require changing, adding, and/or deleting any conditions of certification;**
5. **Planned activities during non-operation, including any measures to ensure continued compliance with all conditions of certification and LORS;**
6. **Written monthly updates (or other CPM-approved greater intervals) to the CPM for non-operational periods, until operation resumes; and**
7. **Projected date for the resumption of operation.**

C. If, at the time of unplanned closure, the project owner expects or intends that the closure will be permanent, the project owner will prepare a permanent closure plan and submit the plan within 60 days of the date the plant ceases operations.

If the project experiences an unplanned temporary closure and the project owner subsequently determines that the temporary closure will become permanent, the project owner will prepare a permanent closure plan and submit the plan within 60 days of the determination of permanent closure.

C. COM-15 should be replaced in its entirety, as follows:

COM-15 Permanent Closure Plan

A planned temporary closure for maintenance or repairs does not need to be reported to the CPM, except in the annual report.

If the project owner determines to close the project permanently, the project owner shall inform the CPM as soon as practicable after the determination to permanently close the project is made, and no later than 90 days before the project ceases operations (unless the project has ceased operations due to a sudden or unexpected event, or unless the decision to permanently close the facility is due to a sudden or unexpected event). Within 30 days after notifying the CPM of planned permanent closure, the project owner shall submit a Permanent Closure Plan.

Prior to submittal of the facility's Permanent Closure Plan to the Energy Commission, the project owner and the CPM will hold a meeting to discuss the specific contents of the plan. In the event that significant issues are associated with the plan's approval, the Commission may hold one or more workshops or hearings, before or after submission of the Permanent Closure Plan.

The Permanent Closure Plan shall include, but is not limited to:

1. **A statement of specific Final Closure Plan objectives;**
2. **A comprehensive scope of work for permanent plant closure and, if the project site is to be retained by the project owner, long-term site maintenance activities, with a description and explanation of methods to be used, broken down by phases, including, but not limited to:**
   a. **Dismantling and demolition;**
   b. **Recycling and site clean-up;**

c. Impact mitigation, if any, and monitoring, if necessary;

d. Site remediation and/or restoration, including ongoing testing or monitoring protocols, if necessary;

e. Exterior maintenance, including paint, landscaping and fencing, during demolition and site restoration, if required; and

f. Site security and lighting.

2. A schedule projecting all phases of closure activities for the power plant site and all appurtenances constructed as part of the Energy Commission-certified project;

3. An electronic submittal package of all relevant plans, drawings, risk assessments, and maintenance schedules and/or reports, including an above- and below-ground infrastructure inventory map and registered engineer's or DCBO's assessment of demolishing the facility; additionally, for any facility that ceased operation prior to submitting a Permanent Closure Plan and for which only minimal or no maintenance has been done since, a comprehensive condition report focused on identifying potential hazards;

4. All information additionally required by the facility's conditions of certification applicable to plant closure;

5. An equipment disposition plan, including:

a. Recycling and disposal methods for equipment and materials; and

b. Identification and justification for any equipment and materials that will remain on-site after closure;

6. A site disposition plan, if applicable, including but not limited to:

a. Proposed rehabilitation, restoration, and/or remediation procedures, as required by applicable LORS, and long-term site maintenance activities.

b. Identification of all current conditions of certification, LORS, federal, state, regional, and local planning efforts applicable to the facility, and proposed strategies for achieving and maintaining compliance during closure;

c. Updated mailing list and Listserv of all responsible agencies and property owners within one (1) mile of the facility;

d. Description of and schedule for security measures and safe shutdown of all non-critical equipment and removal of hazardous materials and waste (see conditions of certification for Public Health, Waste Management, Hazardous Materials Management, and Worker Safety).

The Executive Director may approve the Permanent Closure Plan or may refer the Plan to the full Commission for approval.

Appendix A
Resumes

AES Alamitos Energy, LLC
690 North Studebaker Road
Long Beach, CA 90803
tel 562 493 7750
fax 562 493 7320

Stephen O'Kane

Vice-President, AES Alamitos Energy, LLC
Manager, Sustainability and Regulatory Compliance

Education

M.S., Atmospheric Science
B.S., Atmospheric Science

Relevant Experience

Mr. O'Kane has over 20 years of experience in energy, environmental assessment and project development, including assignments as project manager for regulatory applications for the development of new thermal generation projects and applications for certification (AFC) before the California Energy Commission (CEC). In addition to managing, directing or contributing to the licensing and permitting process for development projects he has also prepared environmental assessments, air quality analyses and permit applications, prepared project feasibility studies, managed facility compliance systems, and prepared sustainability plans for projects and organizations in the energy industry.

Representative Projects

AES Southland Development:

Huntington Beach Energy Project
AES Alamitos Energy Center
AES Redondo Beach Energy Project

Vice-President of Development, Permitting Manager and Applicant to the California Energy Commission (CEC) for the redevelopment of the AES Southland thermal generation fleet. As the Permit and Sustainability Manager, provided design criteria, reviewed engineering proposals and design, prepared analytical assessments and managed the preparation of the Applications for Certification (AFC) to the CEC for three electric utility generating stations in the western Los Angeles local reliability area.

AES Alamitos Energy Storage

Vice-President of Development, Permitting Manager and Applicant to the City of Long Beach for the development of a 300 MW battery energy storage system at the AES Alamitos Generating Station. As the Permit and Sustainability Manager, provided design criteria, reviewed engineering proposals and design, prepared analytical assessments and managed the preparation of the Applications for a Conditional Use Permit, Local Coastal Development Permit, Standards Variance and Mitigated Negative Declaration to the City of Long Beach for a 300 MW battery energy storage system.

AESWapiti, Tumbler Ridge, BC
Project Manager for the Application for Project Approval to the BC Environmental Assessment Office for the Wapiti Power Development Project near Tumbler Ridge, BC. Major project components were a 184 MW biomass and coal fired circulating fluidized bed boiler and power plant, 35 km of 230kV transmission line and a 750,000 tonne per year surface coal mine.

AES Gener, Chile
Engineering specialist for the assessment and retrofit of the AES Nuevo Renca combined cycle power plant and the Ventanas thermal generating station.

AES Corporation: Highgrove Energy, California
Edison Mission Energy: Walnut Creek Energy Project, California
Calpine: Los Esteros Critical Energy Facility, California
PacifiCorp: Hunter Plant, Utah
Shell International: Pearl GTL, Doha, Qatar
Served as the Project Manager, Deputy Project Manager or Task Manager for numerous energy development applications to the California Energy Commission, US Environmental Protection Agency, Qatar Supreme Council of the Environment or local permitting agencies. Project Manager of record or primary author of individual sections of application submittals and environmental assessments. Lead or participant on community relations teams, gave testimony for regulating agencies and wrote public announcements and newsletters.

Island Cogeneration Project, B.C. Canada
Preparation of an "Application for a Project Approval Certificate" for the BC Environmental Assessment Office for the 275 MW cogeneration project at the Elk Falls pulp mill in Campbell River, BC. Project Manager and air quality technical lead for the environmental analysis of the proposed power plant, cooling tower, and adjacent pulp mill. Conducted stakeholder consultation with relevant regulatory agencies, community groups and NGOs and author of the environmental assessment section of the project report.

Los Angeles Department of Water and Power – "Owens Valley PM10 Planning Area, Demonstration of Attainment, State Implementation Plan, 2003 Revision"
Project Manager for the state implementation plan (SIP) revision prepared in conjunction with the Great Basin Unified Air Pollution Control District (GBUAPCD) to meet federal requirements in the Clean Air Act Amendments of 1990. The revised SIP included an analysis of the particulate matter air pollution problem in the Owens Valley and provided a control strategy to reduce emissions from the dry Owens Lake bed.

BP Energy, Burlington Resources, Talisman Energy, North Star Energy, Canadian Natural Resources Ltd., British Columbia and Alberta, Canada.
Project Manager and developer of an assessment and test protocol for well test flares in conjunction with the Oil and Gas Commission, the BC Ministry of Environment and a number of gas producers. Completed numerous pre- and post-flare air quality impact assessments of sulphur dioxide emissions from sour gas well tests and conducted onsite monitoring and forecasting.

US Air Force, Onizuka Air Force Station, Sunnyvale, California
Project Manager and lead technical specialist for the an application for a Bay Area Air Quality Management District, Permit to Operate for the Onizuka Air Force Station power plant.

Jerry Salamy

Air Quality Permitting Specialist

Education

B.A., Chemistry

Relevant Experience

Mr. Salamy has more than 25 years of experience, including assignments as project manager for applications for certification (AFC) before the California Energy Commission (CEC). He has also prepared air quality permit applications, prepared project feasibility studies, assessed industrial facilities compliance with state and federal air pollution rules and regulations, and assisted power plant clients with compliance-related issues.

Representative Projects and Dates of Involvement

Project Manager and Air Quality Lead; Application for Certification; Huntington Beach Energy Project; AES Southland Development LLC; Huntington Beach, CA. Managed the preparation of the air quality section of an AFC for a 1,185-MW combined cycle repower of the existing Huntington Beach Generating Station located in Huntington Beach, CA. The project required the preparation of numerous other studies and a Prevention of Significant Deterioration (PSD) permit application submitted to the South Coast Air Quality Management District. Air permitting required extensive document preparation to demonstrate the project was employing the Best Available Control Technology to control greenhouse gas emissions.

Project Manager and Air Quality Lead; Application for Certification; Alamitos Energy Center; AES Southland Development LLC; Long Beach, CA. Managed the preparation of the air quality section of an AFC for a 1,950-MW combined cycle repower of the existing Alamitos Beach Generating Station located in Long Beach, CA. The project required the preparation of numerous other studies and a Prevention of Significant Deterioration (PSD) permit application submitted to the South Coast Air Quality Management District. Air permitting required extensive document preparation to demonstrate the project was employing the Best Available Control Technology to control greenhouse gas emissions. The project also required the submittal of an Air Quality Related Values analysis to the Federal Land Manager (National Forest Service) to assess project impacts on Class I area, consistent with the PSD program requirements.

Project Manager and Air Quality Lead; Application for Certification; Redondo Beach Energy Project; AES Southland Development LLC; Redondo Beach, CA. Managed the preparation of the air quality section of an AFC for a 546-MW combined cycle repower of the existing Redondo Beach Generating Station located in Redondo Beach, CA. The project required the preparation of numerous other studies and a Prevention of Significant Deterioration (PSD) permit application submitted to the South Coast Air Quality Management District. Air permitting required extensive document preparation to demonstrate the project was employing the Best Available Control Technology to control greenhouse gas emissions. The project is actively opposed by several public groups and the City of Redondo Beach.

Deputy Project Manager and Air Quality Lead; Application for Certification; Mariposa Energy Project; Diamond Generating Corporation; Tracy, CA. Managed the preparation of the air quality section of an AFC for a 200-MW peaking power plant in near Tracy, CA. The project required the preparation of numerous other studies and a permit application submitted to the Bay Area Air Quality Management District. Air permitting required extensive document preparation to demonstrate the project was employing the Best Available Control Technology to control air emissions. The project was highly contested with a significant level of public involvement.

Air Quality Lead; Application for Certification; Rice Solar Energy Project; SolarReserve. Managed the preparation of the air quality section of an AFC for a 150-MW concentrating solar power plant in San Bernardino County, CA. The project required the preparation of numerous other studies and a permit application submitted to the Mojave Desert Air Quality Management District. Air permitting required extensive document preparation to define air emissions associated with the thermal energy storage system due to its unique characteristics.

Project Manager; Application for Certification; East Altamont Energy Center, Calpine Corp.; Tracy. Managed the preparation of the East Altamont Energy Center AFC for a 1,100-MW power plant in Tracy. Mr. Salamy also prepared the alternative site and generating technologies, ammonia risk assessments, and provided general licensing support.

Project Manager; Application for Certification; Los Esteros Critical Energy Facility; Calpine C*Power; San Jose, CA. Managed the preparation of the AFC for a 180-MW power plant in San Jose. The project required the preparation of numerous other studies/documents to satisfy the CEC staff request. These studies/documents included the preparation of a general plan amendment and planned development zoning applications, archaeological and paleontological survey reports, and biological resource protection permits. Mr. Salamy also managed the development and implementation of biological, cultural, and paleontological resource monitoring programs; risk management plan; traffic and transportation management plan; waste reduction program; and an electromagnetic force evaluation for project construction.

Deputy Project Manager; Application for Certification; Metcalf Energy Center; Calpine Corp.; San Jose, CA. Assisted in the management of the preparation of the Metcalf Energy Center AFC. Mr. Salamy was responsible for the development and tracking of data response submittals requested by the CEC. Mr. Salamy also authored data responses for hazardous materials management.

Air Quality Lead; Application for Certification; Sutter Power Plant; Calpine Corp.; Yuba City, CA. Managed the preparation of the air quality section of the Sutter Power Plant AFC. The air quality analysis required the preparation of an environmental setting for the project site, a criteria and toxic pollutant emission inventory, a Best Available Control Technology analysis, and air dispersion modeling. These analyses were used to support the preparation of a Prevention of Significant Deterioration and New Source Review permit applications. These applications were submitted to the U.S. EPA Region IX office and the Feather River Air Quality Management District for the issuance of a construction permits. The scope of work also required the identification of emission reduction credits (ERCs) to support the New Source Review permitting process. Mr. Salamy was instrumental in locating and negotiating for the purchase of the ERCs necessary for the siting of the Sutter Power Plant.

Project Manager; Air Quality Audits, SMUD. Managed air quality audits for four power plants in Northern California. He conducted air quality audits of the Central Valley Finance Authority's Carson Energy Facility and McClellan Gas Turbine Facility and oversaw air quality audits at the Sacramento Cogeneration Authority – SCA Cogen II and Cogen III. Mr. Salamy's responsibilities included managing the development of the pre-audit checklist and field interview forms; conducting kick-off, pre-audit, and close-out audit meetings; conducting field interviews and audits; summarizing and presenting findings; and preparing the final audit reports.

Project Manager and Air Quality Lead; Apex Generating Station Licensing; Mirant Inc.; Las Vegas, NV. Managed the licensing of Mirant's 1,100-megawatt Apex Generating Station. Mr. Salamy prepared a Prevention of Significant Deterioration Pre-Construction Permit Application for the project, as well as the preparation of a National Environmental Policy Act Environmental Assessment to support the siting of the 500-kilovolt transmission line.

ROBERT L. SIMS
Manager Engineering and System Planning
The AES Corporation, Engineering and Construction

Mr. Sims currently manages engineering and planning for the high voltage utility interconnection of several AES generating facilities in the US and overseas. These generating facilities interconnect at voltages up to 230 kV and generating capacities up to 2000 MW. Mr. Sims joined the AES Corporation in 2005 with the acquisition of SeaWest wind power.

He recently completed the 230 kV interconnection work for one of the largest solar projects in the US with a capacity of 200 MW connected to the California ISO system in Southern California at 230 kV. This involved the management and negotiation of several Agreements with San Diego Gas and Electric and the CAISO as well as managing the engineering, procurement and construction of a 5 mile 230 kV line and 230 kV substation for the project.

While at SeaWest from 1999 to 2005, Mr. Sims held the position of Vice President of Engineering and managed the planning, engineering, & construction of numerous utility scale wind energy projects in California, Wyoming, Oregon, and Texas. These generating facilities interconnect at voltages of 115 – 230 kV with capacity of up to 500 MW.

Prior to joining SeaWest in 1999 Mr. Sims provided consulting services for 2 years in the area of utility interconnection to a large number of renewable energy development companies for projects in North America and other areas of the world

From 1981 to 1996 Mr. Sims held the position of Electrical Engineering manager at Kenetech WindPower. While at Kenetech Mr. Sims was responsible the planning design and utility interconnection of a large number of wind energy projects located in California, Wyoming, Texas, Canada, Europe, and Central America.

Mr. Sims served in 2006 as President of the Texas Wind Coalition, a wind industry advocacy group promoting wind policies in Texas and the Southern Plaines based in Austin, Texas. He is a regular participant and speaker at renewable and utility industry meetings and conferences.

Mr. Sims has co-authored several papers on wind energy, including the IEEE recommended practice "Design and Operation of Windfarm Generating Stations."

Mr. Sims holds a Bachelor of Science degree in Electrical Power Engineering from California Polytechnic University.

Melissa Fowler

Small Mammal Ecologist/Wildlife Biologist

Education

M.S., Environmental Studies, Emphasis: Environmental Science, California State University, Fullerton, 2010
B.S., Biological Science, California State University, Fullerton, 2005
A.A., Liberal Studies, Fullerton College, Fullerton, 2001

Distinguishing Qualifications

- More than 10 years of experience conducting wildlife studies
- Experience conducting botanical surveys, wildlife surveys, habitat assessments, vegetation mapping, biological monitoring, rare plant surveys (primarily in the Mojave Desert), re-vegetation monitoring and wetland delineations

Relevant Experience

Ms. specializes in small mammal ecology, particularly desert species, and wildlife biology. She has more than 12 years of experience conducting a variety of wildlife studies in a range of California habitats, including aquatic (freshwater and marine) and terrestrial ecosystems, and has worked with a wide range of species that include large carnivores, small mammals, raptors and other avian species, reptiles, marine fishes and aquatic macroinvertebrates. Ms. Fowler has conducted a variety of surveys for commercial projects including botanical surveys, wildlife surveys, habitat assessments, vegetation mapping, biological monitoring, rare plant surveys (primarily in the Mojave Desert), re-vegetation monitoring and wetland delineations. She has a scientific collecting permit for mammals and reptiles in Kern, Los Angeles, Riverside and San Bernardino Counties and the coast horned lizard in Region 5 (SC-11611).

Representative Projects and Dates of Involvement

Biologist, AES Southland Development, Alamitos Energy Center (AEC), Los Angeles County, California. Prepared the biological resources section for an Application for Certification (AFC) for a natural gas-fired power plant, coordinated with resource agencies and conducted site reconnaissance survey.

Biologist, AES Southland Development, Redondo Beach Energy Project (RBEP), Los Angeles County, California. Prepared the biological resources section for an AFC for a natural gas-fired power plant, coordinated with resource agencies and conducted site reconnaissance survey. Responded to California Energy Commission (CEC) data requests and comments; participated in agency site tour.

Biologist, AES Southland Development, Huntington Beach Energy Project (HBEP), Orange County, California. Assisted with the preparation of the biological resources section for an AFC for a natural gas-fired power plant, coordinated with resource agencies, conducted initial site visit and supplemental botanical and wildlife survey, technical representative for public workshops, and responded to CEC data requests and comments.

Biologist; North Sky River Wind Energy Project; NextEra; Kern County, California. Conducted rare plants surveys along a transmission line corridor. Attended county planning meeting and participated in the renewable energy forum, which included multiple stakeholders. Assisted with biological monitoring during the construction phase.

Biologist; Confidential Client; Los Angeles County, California. Prepared the biological resources section for an Application for Certification (AFC), coordinated with resource agencies and conducted site reconnaissance survey.

Biologist; Confidential Client; Saudi Arabia. Prepared baseline sections for terrestrial biological resources and marine ecology, impact assessments, and mitigation sections for an Environmental Impact Assessment (EIA) for a chemical plant.

Biologist; Union Pacific Railroad; Imperial County, California. Conducted preconstruction clearance surveys for burrowing owls, habitat assessments and construction monitoring for desert pupfish.

Biologist; Terra-Gen Power, LLC; Kern County, California. Supported multiple projects by conducting wetland delineations, habitat assessments, vegetation mapping, condor monitoring and multiple wildlife surveys, desert tortoise and Mohave ground squirrel monitoring, geotechnical escorting, potholing monitoring, assisted with protocol southwestern willow flycatcher surveys, supported project permitting, including multiple LSAs and Section 401 Waste Discharge Requirements (WDR), and prepared technical memos.

Biologist; Confidential Client; San Bernardino County; California and Mohave County, Arizona Assisted with wetland delineations and vegetation mapping for the updated project boundary.

Biologist; Confidential Client; Orange County, California. Assisted with the preparation of the biological resources section for an Application for Certification (AFC), coordinated with resource agencies, conducted initial site visit and supplemental botanical and wildlife survey, and responded to California Energy Commission (CEC) comments.

Biologist; Confidential Solar Energy Client; Kern County, California. Conducted raptor migration and raptor landscape use surveys throughout the proposed wind energy site.

Biologist; Confidential Client; Iraq. Prepared baseline ecology, impact assessment, and mitigation sections for an Environmental and Social Impact Assessment (ESIA) for a water treatment plant. Ecology baseline included terrestrial and wetland habitats.

Biologist; Confidential Wind Energy Client; San Bernardino County, California. Conducted delineation surveys of ephemeral washes for a potential mitigation site in the Mojave Desert. Prepared report for delineation surveys and analyzed the suitability of confidential location as a mitigation site for a solar project.

Biologist; San Timoteo Canyon Derailment; Union Pacific Railroad; Riverside County, California. Conducted re-vegetation monitoring of site restoration activities for derailment affected areas, replanting of native vegetation and establishment of weed management areas were conducted in accordance with U.S. Army Corps of Engineers (USACE) (USACE #2006-01654-JPL) and State Water Resources Control Board (State Water Board) (WDID #836C343929) requirements. Prepared annual re-vegetation monitoring report.

Biologist; Confidential Solar Energy Client; Inyo County, California. Prepared the Clean Water Act (CWA) Section 401 Water Quality Certification (WQC) for the Colorado River Basin Regional Water Quality Control Board (RWQCB).

Biologist; Confidential Wind Energy Client; Riverside County, California. Prepared application packages for a proposed wind energy project for a Lake and Streambed Alteration (LSA) Notification for California Department of Fish and Game (CDFG) and the CWA Section 401 WQC for the Colorado River Basin RWQCB.

Biologist; Confidential Solar Energy Client; Riverside County, California. Prepared the Evaporation Pond Plan and assisted with preparing the Biological Resources Mitigation Implementation and Monitoring Plan.

Biologist; TID Almond 2 Power Plant; Turlock Irrigation District; Stanislaus County, California. Conducted construction and dewatering monitoring for the giant garter snake within areas of suitable habitat.

Biologist; Confidential Solar Energy Client; Imperial County, California; 2011. Prepared and revised avian and bat protection plans for two proposed solar farms in Imperial County, California.

Natalie Lawson, M.A., RPA

Cultural Resources Specialist

Education

California State University, Fullerton, California, M.A., Anthropology
Arizona State University, Tempe, Arizona, B.S., Chemistry, (minor, Anthropology)

Professional Registrations

Registered Professional Archaeologist (RPA)

Distinguishing Qualifications

- Meets Secretary of Interior Professional Qualification Standards (36CFR61)
- Experienced in cultural resource management and Section 106 of the National Historic Preservation Act consultation
- Experienced in the National Environmental Policy Act (NEPA) and California Environmental Quality ACT analyses (CEQA)
- Listed on California and Nevada BLM permits for CH2M

Representative Projects and Dates of Involvement

Confidential Pipeline Project, Orange, Los Angeles, San Diego, Kern, Ventura, Santa Barbara, San Luis Obispo, Kings, San Bernardino, Riverside, and Fresno Counties. (1/2013 to present). Principal Investigator. Ms. Lawson is the principal investigator for cultural resources support for this project and has completed literature reviews, archaeological surveys, Native American consultation, test excavations, and monitored construction at different locations throughout California. Ms. Lawson has also conducted Native American consultation on behalf of the client, and prepared testing plans, monitoring plans, Native American consultation plans, survey reports, testing reports, and monitoring reports in support of this work. Fieldwork for this project includes pedestrian survey for several locations, approximately 3 weeks, monitoring of construction and geotechnical work, approximately 4 weeks, and Phase II testing of different locations, approximately 4 weeks.

Santa Susana Field Laboratory. Los Angeles and Ventura Counties, California. (May 2013 to December in 2013; September 2015to present). Researcher, Ethnographer. Ms. Lawson conducted archival research and telephone interviews to start the identification process for a potential Traditional Cultural Property within the NASA owned portion of the field laboratory. Ms. Lawson also wrote the initial report identifying a potential TCP. In the next phase of work, Ms. Lawson is part of the team preparing an ethnography for the SSFL.

ISEGS-Roads Mitigation and Tortoise Fencing Mitigation. San Bernardino County, California. (December 2012, January 2013, September 2014, November 2015 to March 2016). Principal Investigator, Field Director. Ms. Lawson conducted the archaeological evaluation of several roads on BLM land in San Bernardino County slated for closure. This project also included 40 miles of proposed tortoise fencing along I-40 and I-5. Ms. Lawson conducted the pedestrian survey, directed site recordation, and led in the preparation of the technical report and site evaluation. Ms. Lawson was the primary author on the final reports. Fieldwork for this project included 3 weeks of pedestrian survey and 1 week of monitoring.

Narlon Bridge, Vandenberg Air Force Base. Santa Barbara County, California. (March 2013 and February 2016) Field Director. Ms. Lawson is the field director for cultural resources support for this project and has prepared testing plans and reports for work within identified archaeological sites within

the Union Pacific Railroad corridor for improvements to the UPRR line. She is also the field director for test excavations which have been completed and proposed for this project. Fieldwork for this project totals two weeks.

Mission Rock Energy Center. Ventura County, CA. (September 2015- October 2015). Ms. Lawson is the primary author on the cultural section for the MREC AFC. She also directed the field survey and serves as the Safety Coordinator for the project. Fieldwork for this project totals one week. Project is not yet complete.

Alamitos Energy Center. Los Angeles County, CA (April 2012 to June 2012, August 2013 to January 2014, September 2015). Ms. Lawson assisted in the completion of the literature search and the archaeological survey for the AEC. She also prepared the cultural resources section of the AFC for the AEC and the responses for the Data Adequacy phase.

Proposition 50. Colusa, Sutter, Shasta, and Yolo Counties. (March 2014 – September 2014). Principal Investigator. Ms. Lawson was the Principal Investigator for cultural studies conducted related to the drilling of several new wells within the ACID, FWD, RD108, Sutter Mutual Water Company, Pelger Mutual Water District, and Meridian Farms Water Company in Northern California. Ms. Lawson conducted pedestrian surveys and prepared a total of five technical reports. Ms. Lawson also recorded several resources and evaluated impacts for each resource related to these projects. Fieldwork for this project totaled three days.

Francisco Boulevard. Marin County, California. (November 2013 to December 2013). Principal Investigator. Ms. Lawson was the principal investigator for the Francisco Boulevard project in Caltrans ROW in Marin County. Ms. Lawson assisted in the preparation and final review of the technical reports for this project.

I-680 Improvements. Contra Costa County, California. (November 2013 to December 2013). Principal Investigator. Ms. Lawson was the principal investigator for the I-680 Improvement project in Caltrans ROW in Contra Costa County. Ms. Lawson prepared the technical reports for this project.

Chiquita Canyon Landfill, Bowers Cave. Los Angeles County, California. (November and December of 2012, and January 2013). Field Director. Ms. Lawson conducted the literature search and prepared the testing plan for the evaluation phase of the well-known archaeological site, Bower's Cave. Ms. Lawson also directed the evaluation phase field studies. Fieldwork for the survey was completed in one week. Fieldwork for the Phase II work was completed in one week. Additional research, Native American consultation, artifact analysis, and completion of the final technical report are ongoing.

Walnut Creek Energy Project. Los Angeles County, CA. (June 2011 thru January 2013). Cultural Resources Specialist. Ms. Lawson was the designated Cultural Resources Specialist for the WCEP project. Ms. Lawson was the primary author on the WCEP CRMMP. Ms. Lawson oversaw monitoring activities at the construction site and prepared monthly reports for all monitoring activities and completed the final Cultural Resources Report. Ms. Lawson also acted as a Cultural Resources Monitor for 4 days at various times during construction.

Redondo Beach Energy Project. Los Angeles County, CA. (May 2012 to July 2012 and January 2013). Ms. Lawson prepared the cultural resources section of the AFC for the RBEP. She was also the primary author on all Data Requests for cultural resources.

East Bay Hills. Alameda and Contra Costa Counties, California. (October 2012 to November 2012). Field crew. Fieldwork totaled three weeks. Ms. Lawson assisted with the archaeological survey for FEMA work within the East Bay Hills.

Williams Expansion Pipeline, Washington State. Ms. Lawson participated in the pedestrian survey of nearly 200 miles of pipeline survey in western Washington. Ms. Lawson acted as crew chief for this project. Work was conducted in October 2012 and fieldwork totaled three weeks.

Bright Star Canyon Wind Energy Project. Kern County, CA. Ms. Lawson conducted cultural studies for the construction of a wind farm in the Tehachapi Mountains. Ms. Lawson directed the cultural pedestrian survey, and worked on the preparation of the final technical memo, including site records. Work was done in August 2012. Fieldwork totaled two weeks.

Huntington Beach Energy Project. Orange County, CA. (April 2012 to May 2012, July 2012, October 2012, August 2015). Ms. Lawson prepared the cultural resources section of the AFC for the HBEP. She was also the primary author on all Data Requests for cultural resources.

Fort Irwin Solar Project. San Bernardino County, CA. (April 2012 and June 2012). Field director. Fieldwork was conducted over one month. Ms. Lawson conducted cultural studies for a proposed solar farm at Fort Irwin, CA including the Phase I pedestrian survey and preparation of the final report.

Hidden Hills Ranch Solar Generation Station, Inyo County, California and Clark and Nye Counties, Nevada. (June 2011 to October 2011). Field Director. Ms. Lawson assisted with the archaeological evaluation of a solar farm project in Inyo County and the associated 100-mile-long transmission line corridor within Clark and Nye Counties, Nevada. Ms. Lawson conducted the literature search for the transmission line corridor and assisted with the preparation of the research design for the pedestrian survey. Ms. Lawson also participated in the pedestrian survey for both the solar project and the transmission line corridor. She assisted with site recordation in both California and Nevada on CA Department of Parks and Recreation and IMACS forms. Ms. Lawson was an author on the final reports and conducted additional archival research for the CEC Data Adequacy Phase. Ms. Lawson assisted in the preparation of an additional study for this project which endeavored to identify historic and prehistoric roads and trails. Roads and trails were identified through archival research, pedestrian survey, and remote imagery analysis. Various field visits occurred for this project, totaling approximately three months of fieldwork.

Blue Sky Energy Project. Los Angeles County, California. Ms. Lawson conducted cultural studies for the construction of a wind farm in the Mojave Desert in Los Angeles County, California. Ms. Lawson directed the cultural pedestrian survey and site recordation. Work was done in September 2011. Fieldwork consisted of 4 days.

Turlock Irrigation District, Almond 2 Power Plant. Stanislaus County, California. Ms. Lawson conducted cultural studies for the preparation of the AFC license for the new construction of the Almond 2 Power Plant in Ceres, CA. Ms. Lawson conducted the literature search, Native American consultation, cultural pedestrian survey, and prepared the final technical memo and wrote the cultural section of the AFC application. Ms. Lawson also participated in the geoarchaeological study which was conducted along the proposed gas line route. Work was done in February 2009, April 2011, and June 2011. Fieldwork was conducted at various times, totaling two weeks.

North Sky River Wind Energy Project. Kern County, California. Ms. Lawson conducted cultural studies for the construction of a wind farm in the southern Sierra Nevada Mountains in Kern County, California. Ms. Lawson directed the cultural pedestrian survey and the Phase II test excavations of several prehistoric sites, and prepared the final technical reports. Work was done September 2010 through December 2010 and February 2012. Fieldwork totaled 3 months.

Southern California Edison Canyon Power Plant. Orange County, California. (August 2010). Cultural Resources Monitor. Fieldwork for this project was one month. Ms. Lawson was the Primary Monitor of

construction activities for the construction of the Southern California Edison Canyon Power Plant in Orange County, California.

Sun Creek Wind Energy Project. Kern County, California. Ms. Lawson conducted cultural studies for the construction of a wind farm near Mojave in Kern County, California. Ms. Lawson directed the cultural pedestrian survey and prepared the final technical memo, including site records. Work was done in May, June, and July 2010. Fieldwork totaled two weeks.

River Bluff Solar Energy Park. San Bernardino County, California. Ms. Lawson conducted cultural studies for the construction of a solar farm near Barstow in San Bernardino County, California. Ms. Lawson conducted the literature search and the Native American consultation, directed the cultural pedestrian survey, and prepared the final technical memo, including site records. Work was done in February 2010. Fieldwork was conducted over one week.

Alta Oak Creek Mojave Wind Renewable Energy Project. Kern County, California. Ms. Lawson conducted cultural studies for the construction of a wind farm in the Tehachapi Mountains and adjacent Mojave Desert in Kern County, California. Ms. Lawson conducted the literature search and the Native American consultation, directed the cultural pedestrian survey, and prepared the final technical memo, including site records. Ms. Lawson also prepared the testing plan for the evaluation phase of this work, directed the evaluation phaSisse field studies, and assisted with the preparation of the final evaluation report. Work was done in August 2009 through November 2009 and February 2010. Fieldwork was conducted over 6 weeks.

Gray Butte Solar Array Project, Edison Mission Energy. San Bernardino County, California. Ms. Lawson participated in the preparation of cultural studies for the construction of a solar farm near Phelan, California. Ms. Lawson conducted the Native American consultation, directed the cultural pedestrian survey, and assisted with the writing of the final technical memo. Work was done in September and October 2009. Work was conducted over one week.

Monte Vista Solar Project, PV 12, Edison Mission Energy. Kern County, California. (September and October 2009). Field Director. Ms. Lawson conducted cultural studies for the construction of a solar farm near Mojave, California. Ms. Lawson conducted the Native American consultation, directed the cultural pedestrian survey, and prepared the final technical memo and prepared site records. Fieldwork was conducted over two weeks.

Contra Costa Generating Station. Contra Costa County, California. (September 2009). Ms. Lawson conducted cultural studies for the preparation of the AFC license for the new construction of the Contra Costa Generation Station. Ms. Lawson conducted the literature search, Native American consultation, cultural pedestrian survey, and prepared the final technical memo and wrote the cultural section of the AFC application.

Port Hueneme. Ventura County, California. (March 2009). Principal Investigator. Ms. Lawson conducted cultural studies for at the Naval Construction Battalion Center at Port Hueneme in Ventura County, California. Ms. Lawson conducted the pedestrian survey and evaluation of several historic rail lines. Fieldwork was completed in two days.

PG&E Humboldt WaveConnect Hydrokinetic Pilot Project FERC License Application. (September 2009 through December 2009). Principal investigator. Ms. Lawson conducted cultural studies for the construction of a pilot wave farm near Eureka, California. Ms. Lawson conducted a search of the State Land Commission Shipwreck Database, completed the Native American consultation and the cultural pedestrian survey for the terrestrial facilities, and prepared the final cultural section for the FERC License Application. Fieldwork was completed in one day. Additionally, Ms. Lawson prepared site records for the cultural section.

Darrah Road Bridge Widening. Mariposa County, CA. (October 2008 and February 2009) Principal Investigator. Ms. Lawson prepared the final Historical Property Survey Report (HPSR, Caltrans) for the widening of the Darrah Road Bridge as well as updating appropriate site records, conducting the Native American consultation, and updating the literature search.

National Ecological Observation Network (NEON), U.S., including AK and HI, Puerto Rico. The NSF is building several observation towers throughout the greater U.S. and Puerto Rico to study climate change and threatened species. Ms. Lawson conducted literature searches and archival research for the following states: Alaska, Washington, Wyoming, California, Massachusetts, and Florida. Ms. Lawson also is an author for the cultural sections of the following states: VA, FL, GA, TN, AL, WI, MI, WA, CA, AK, KS, MA, NH. Work was done in November and December of 2008 and January of 2009.

Siskiyou Telephone, Godfrey Ranch, Siskiyou County, CA. Ms. Lawson conducted cultural studies for the expansion of telecommunications cable along forest service roads in Siskiyou County, CA including the initial literature search, Native American consultation, Phase I pedestrian survey, and preparation of the final report. Work was done in October and November 2008. Fieldwork was conducted over four days.

Ivanpah Solar Generating Station, San Bernardino County, CA. (September 2008). Ms. Lawson participated in additional field studies of several locations around the Ivanpah SEGS project area, including pedestrian survey and site recordation and evaluation. Ms. Lawson also conducted additional archival research of the project area and was an author on the final report of this portion of the field studies. Fieldwork was conducted over one week.

Iberdrola Renewables, AZ, NM, NV, and CA. Ms. Lawson conducted literature searches for several fatal flaw analyses of solar projects in Arizona, California, Nevada, and New Mexico. Five study areas of this overall project are located in Arizona; two are in Maricopa County, two are in La Paz County, and one project is located partially in La Paz and Yuma Counties. Project acreages range from 5,800 acres to 35,000 acres. Three of these study areas are located in California; two areas are in San Bernardino County and one is located in Imperial County. Project acreages range from 13,000 to 29,000. Three of these study areas are located in Nevada; two are in Nye County and one is located in Clark County. Project acreages range from 7,500 to 12,000. The remaining study area is located in Hidalgo County, New Mexico. Total acreage of this project is 25,000. Work was done for this project in June, July, and August of 2008. Fieldwork consisted of a series of site visits which totals 4 days.

Bridger Buttes, WY. Ms. Lawson conducted the literature search and assisted in the writing of the cultural section of a fatal flaw analysis to determine the level of technical studies required for a proposed solar farm project. Work was done in August 2008.

Lodi Energy Center Project. San Joaquin County, California. (July 2008 and August 2008). Field Director. Ms. Lawson conducted cultural studies for the preparation of the AFC license for the expansion of the Lodi Energy Plant in Lodi, CA. Ms. Lawson conducted the literature search, Native American consultation, cultural pedestrian survey, and prepared the final technical memo and wrote the cultural section of the AFC application. Ms. Lawson also participated in the geoarchaeological work completed prior to certification. Fieldwork for the survey and the geoarchaeological work lasted one week.

California Border Patrol-Indio Station. Riverside County, CA. (June 2008). Report Author. Ms. Lawson conducted cultural studies for the expansion of the CA Border Patrol station in Indio, CA including the initial literature search, Native American consultation, Phase I pedestrian survey, and preparation of the final report. Fieldwork was completed in one day.

Old Ridge Route. Los Angeles County, CA. (March 2008 to September 2008). Archaeological Monitor. Fieldwork totaled 6 months. Ms. Lawson monitored road repairs to an historic highway in northern Los Angeles County. Other duties included site recordation.

Colorado Lagoon, Long Beach, CA. (December 2007). Field work was completed in one day. Ms. Lawson conducted a Phase I survey (intensive pedestrian survey) of 10 acres and is the primary author of final letter report.

Copper Mountain Verizon Wireless, Twenty-nine Palms, CA. (October 2007). Field work was completed in one day. Ms. Lawson visited a proposed location for cell tower upgrades and wrote a site report for proposed impacts.

Beaumont Sports Park, Beaumont, CA. (May 2007). All fieldwork was completed in one field day. Ms. Lawson served as Field Director for a CEQA Phase I survey of 20 acres and is the primary author of final report. She was responsible for the supervision of one additional field crew member.

Beaumont Bike Path, Beaumont, CA. (April 2007). Fieldwork was completed in one field day. Ms. Lawson served as Field Crew for additional Phase I pedestrian survey of an approximately 10 mile proposed bike path.

3033 Huntington Drive Project, Pasadena, CA. (April 2007). Fieldwork was completed in two weeks. Ms. Lawson served as Field Crew for additional Phase III data recovery at a small Late Prehistoric site during monitoring.

Forest Lawn, Hollywood Hills, Los Angeles, CA. (December 2006 and January 2007). All fieldwork was completed in three days. Ms. Lawson served as Crew Chief for the field survey and supervised two additional field technicians. Duties included survey, site recordation of a single historic site, and extensive archival research of the history of the Forest Lawn- Hollywood Hills property. Ms. Lawson is the primary author of the final Section 106 report.

Our Lady Queen of Angels, San Juan Capistrano, CA. (August 2006). Fieldwork was completed in three days. Ms. Lawson served as Field Crew and assisted in the excavation of a burial found during construction monitoring.

Southern California Edison, El Casco Substation, Beaumont, CA. (June 2006, July 2006, and October 2006). Fieldwork was conducted over 3 weeks. Ms. Lawson served as Field Director, directed the Section 106 pedestrian survey, supervised one additional field crew member, and monitored the geotechnical testing. Additionally, Ms. Lawson was involved in the preparation of the geomorphological testing research design and subsequent ground truthing.

Southern Orange County Transportation Improvement and Infrastructure Project (SOCTIIP), Orange County, CA. (February 2006). Ms. Lawson served as Field Crew and was in the field for this project for approximately one month. She monitored geotechnical testing within the preferred alternative of a proposed toll road.

Mid County Parkway. Riverside County, CA. Fieldwork was conducted for Phase I surveys (intensive pedestrian survey): April 2005 through September 2005 and December 2005 through January 2006; for Extended Phase I survey (limited evaluation phase w/ shovel test excavations): May 2006 through June 2006; for the Phase II evaluation (test excavations and site evaluations): November 2007 through December 2007 for a total of 10 months for all fieldwork. September 2005 to December 2007 (office; report writing, site forms, etc.) Field director, crew chief. Ms. Lawson assisted with preparation of cultural resources component of EIR/EIS for the proposed 51 km long Mid-County Parkway located in western Riverside County, California, which is located in Caltrans District 8. FHWA is the lead agency. Ms. Lawson functioned as Lead Archaeological Surveyor (Crew chief and Field director) for this project

and was involved in the Phase I survey, the Extended Phase I survey, and the Phase II Evaluation and has been an author on the following documents for this project: ASR (Archaeological Survey Report), XPI (Extended Phase I) proposal, XPI Supplemental Proposal, XPI report, HRER (Historical Resources Evaluation Report), AEP (Archaeological Evaluation Proposal), and AER (Archaeological Evaluation Report). All documents were prepared according to the Caltrans Standard Environmental Reference handbook. Two different research designs were written for the XPI proposals and the AEP; Ms. Lawson was a coauthor of these documents and developed the research design for several of the research domains. Ms. Lawson also assisted in the preparation of all site records for the 100+sites included in these reports, the evaluation of the historic archaeological resources for the HRER, directed lab analyses, and conducted the lithics analysis for the Phase II Evaluation. Personnel supervised during eight months of survey work include four-person field crews while serving as crew chief and three field crews of four persons each while serving as field director. Personnel supervised during two months of test excavations include five crews of three to four persons each. Personnel supervised during four months of lab analysis include five laboratory technicians.

Fagan Canyon. Ventura County, CA. (December 2005; March 2006 to May 2006). Fieldwork was conducted for approximately one month. Ms. Lawson served as Field Crew for the CEQA Phase I survey and as Field Director for the CEQA Phase II evaluations for two prehistoric sites. Was responsible for directing field excavations, including 1x1 m test units, feature excavation, mechanical trenching, and was responsible for directing three additional field technicians. Also conducted all artifact analysis and assisted in the preparation of the initial research design as well as the final testing report.

Laguna Canyon Road Widening Mitigation, Orange County, CA. (October 2005, September 2006, and September 2007). Fieldwork was conducted at various times and totaled approximately 7 weeks. Ms. Lawson served as Field Director, assisting with the cultural resource management for the widening of Laguna Canyon Road and subsequent biological mitigation within prehistoric site CA-ORA-1055. This project is located in Caltrans District 12. As field director, Ms. Lawson oversaw unit excavation, feature excavation, and assisted with the monitoring of controlled grading, as well as in the definition of a burial discovered during construction monitoring and supervised up to five field technicians. Additionally, Ms. Lawson conducted analysis of a portion of the flaked stone tools recovered during the monitoring and recovery phases of this project and assisted in the preparation of the final report. A portion of this project included the development of a research design for the geotechnical testing and subsequent ground truthing. Ms. Lawson assisted in the development of this design.

Cultural Resource Assessment of a 20-acre Parcel in Hesperia, Hesperia, CA. (March 2005). Fieldwork was completed in one day. Ms. Lawson served as Crew Chief for this 20 acre CEQA survey, supervised one additional field crew member, and authored the final report.

Murrieta Springs (Tract Map Number 29707), Murrieta, CA. (September 2004). Ms. Lawson served as Lab Director for this project. She prepared site records for a newly recorded site discovered during construction monitoring, conducted artifact analysis of the collection from this new site, and assisted in preparation of final report.

Stoneridge Estates, Moreno Valley, CA. (August 2004). Fieldwork lasted one week. Ms. Lawson served as Field Crew for this survey of approximately 300 acres and the recordation of 12 prehistoric sites. She was an author on the final report.

Orange County Boy Scout Camp, CA-ORA-534, Orange, CA. (July 2004). Fieldwork was completed in one week. Ms. Lawson served as Crew Chief and directed the Phase II excavations, including surface collection, shovel test pits, and 1x1m test units. She was responsible for the supervision of four field technicians.

Trailmark Specific Plan, Romoland, CA. (October 2004 and March 2005). Fieldwork for this project lasted for 3 weeks. Ms. Lawson served as Field Director for the CEQA evaluations of four prehistoric sites, two historic sites, and one combination prehistoric and historic site. She was responsible for directing field excavations, including 1x1 m test units, shovel test pits, mechanical trenching, and surface collection, conducting artifact analysis, supervised three additional crew members, and was the primary author of the final report.

Limonite Senior Project, Pedley, CA. (October 2004). Fieldwork for this project lasted a total of two days. Ms. Lawson served as Field Director for the CEQA Phase I survey of 30 acres and supervised one additional field crew member. She also conducted archival research of a previously recorded resource within the project area, updated the site record the resource recommended to the California Register, and was the primary author of final report.

The Ranch at Point Mugu, Oxnard, CA. (September 2004 and October 2004). Fieldwork totaled one week. Ms. Lawson served as Field Crew for the survey of a small ranch. Two prehistoric sites were recorded and a Phase II evaluation, consisting only of shovel test pits, was conducted at the one of these sites.

McSweeny Farm Project, Hemet, CA. (May 2004 through July 2004, February 2005). Ms. Lawson served as Field Director for a total of 4 months of fieldwork. The project consisted of the Section 106 Phase II evaluations for 14 sites, including prehistoric milling sites, one prehistoric habitation site, and historic refuse dumps. Ms. Lawson was responsible for overseeing unit excavation, shovel test pits, auger testing, supervised six additional crew members, and coordinated with the local Native American groups to provide tribal monitors for the project. She also monitored mechanical trenching within site boundaries, coauthored the Testing and Evaluation Plan, which presented the research design for the test excavations, and authored portions of the final report.

Gibbel Estates Project, 80 Acres, Hemet, CA. (August 2004 and October 2004). Fieldwork for this project lasted for approximately four days. Ms. Lawson served as Field Director for the CEQA survey of 80 acres, the recordation of one new prehistoric site, and the Phase II evaluations of new site and one previously recorded site located within the project. This previously recorded site was recommended eligible to the California Register. Ms. Lawson supervised four additional crew members and was the primary author on final report.

Southern California Edison, Sky Forest, CA. (June 2004). Ms. Lawson served as Crew Chief for this project. Two days were spent in the field. Ms. Lawson was responsible for the literature search and the Section 106 Phase I survey of a power line which was damaged during the Waterman Canyon wildfire. Ms. Lawson supervised one additional crew member.

Cajalco-Ramona Corridor, Riverside County, CA. (May 2004). This intensive pedestrian survey spanned 3 weeks. Ms. Lawson served as Field Director for the Section 106 Phase I survey of 10 mile section of the proposed transportation corridor. Ms. Lawson was responsible for directing the field survey and supervised an additional three crew members.

Wildomar Recycling Master Plan, Lake Elsinore, CA. (April 2004). No fieldwork was conducted for this project. Ms. Lawson provided cultural resource management for a proposed recycled water pipeline, conducted the record search, the archival research, and the Native American consultation for the project, and presented final recommendations for further work.

Rancho Bella Vista, Riverside County, CA. (April 2004). Ms. Lawson served as Lab Director for this project and conducted the artifact analysis of collections recovered at three sites during construction monitoring. She supervised one additional laboratory technician and is the primary author on the final report.

Oak Valley Specific Plan 1 Amendment, Beaumont, CA. (March 2004 through April 2004). Fieldwork for this project lasted a total of 2 months. Ms. Lawson served as Field Director for the CEQA survey of this 2,600 acre project. She was responsible for directing the field survey, supervised four additional crew members, assisted with the recordation of the historic architectural resources, and was the primary author of the final report.

Xavier College Preparatory High School, Thousand Palms, CA. (March 2004). Fieldwork for this project totaled one day. Ms. Lawson served as Field Director for the CEQA Phase I survey of 100 acres, supervised one additional crew member, and assisted in the preparation of the final report.
French Valley Assemblage, Menifee, CA. (February 2004). Fieldwork was conducted in 3 days. Ms. Lawson served as Field Director for the CEQA Phase I survey of 160 acres and assisted in preparation of the final report.

Field Director, Trailmark Specific Plan, Romoland, CA. (February 2004 to April 2004). Fieldwork for this project lasted for 3 weeks. Served as Field Director for the CEQA evaluations of four prehistoric sites, two historic sites, and one combination prehistoric and historic site. Responsible for directing field excavations, including 1x1 m test units, shovel test pits, mechanical trenching, and surface collection, conducting artifact analysis, supervised three additional crew members, and was the primary author of the final report.

Menifee 60 Project, Menifee, CA. (February 2004). Fieldwork was completed in two field days. Ms. Lawson served as Field Director for the CEQA Phase I survey of 60 acres, supervised one additional crew member, and was an author on final report.

Hellman Ranch, Seal Beach, CA. (November 2003 through January 2004). Ms. Lawson participated in fieldwork for this project for a total of 3 months. She served as an Archaeology Technician. Duties included unit excavation, feature excavation, burial excavation, water screen, lab work, and construction monitoring.

National Training Center, Fort Irwin, CA. (August 2003 through October 2003). Ms. Lawson served as an Archaeology Technician and participated in approximately six weeks of fieldwork. She assisted in the Section 106 Phase I surveys as well as in the site recordation of several prehistoric sites. She also participated in limited Extended Phase I surveys, including shovel test pits.

Small Sites at Tomato Springs, Irvine, CA. (June 2003 through August 2003). Ms. Lawson participated in the fieldwork for this project for a total of 3 months. She served as an Archaeology Technician and performed limited extended surveys, and assisted with fieldwork of Phase II evaluations of several small sites, including surface collection, shovel test pits, unit excavation, and feature excavation.

CA-ORA-244, Irvine, CA. (May 2003). Ms. Lawson participated in fieldwork for this project for a total of one month. She served as an Archaeology Technician and assisted with fieldwork of Phase II evaluations, including surface collection, shovel test pits, unit excavation, and feature excavation at a large habitation site near Tomato Springs in Orange County.

Beaumont Survey, Beaumont, CA. (March 2003). Fieldwork was completed in one week. Ms. Lawson served as an Archaeology Technician for a phase I survey of an area with historic homesteads and 1890's gold rush era mines.

Desert Center, CA. (October 2002). Field work was completed in one week. Ms. Lawson served as an Archaeology Technician for Phase III Data Recovery of a small historic site. Duties included unit excavation, feature excavation, dry screening and creating side wall profiles.

Data Recovery, San Bernardino, CA. (October 2002). Field work was completed in one week. Ms. Lawson served as an Archaeology Technician for Phase III Data Recovery of a small historic site. Duties included unit excavation, feature excavation, dry screening and creating side wall profiles.
Fort Irwin Expansion. San Bernardino County, CA. (June 2002 to September 2002). Ms. Lawson participated in fieldwork for this project for approximately 4 months. She served as an Archaeology Technician and performed Section 106 Phase I surveys of BLM land at Avawatz near Fort Irwin, CA. She also assisted in site recordation of several prehistoric and historical sites as well as limited Extended Phase I surveys, including surface collection. This survey of approximately 24, 000 acres was conducted to supplement previous surveys related to the expansion of the National Training Center at Fort Irwin.

Archaeological Data Recovery Excavation at CA-ORA-269, Irvine, CA. (May 2002 through June 2002 and November 2002 through December 2002). Ms. Lawson participated in fieldwork for this project for a total of 3 months. She conducted data recovery at archaeological site CA-ORA-269, within the Planning Area 27 (PA 27) project boundaries, located in the western portion of the San Joaquin Hills in Irvine, California. Ten percent of the site, 200 1x1 m units, were excavated prior to burying the site for construction purposes. Ms. Lawson served as an Archaeology Technician and was responsible for unit excavation, feature excavation, water screen, and laboratory work.

Muddy Canyon, Newport Beach, CA. (May 2002). Ms. Lawson participated in fieldwork for this project for a total of 1 week. She served as an Archaeology Technician and was responsible for unit excavation at CA-ORA-934.

The Rise, Farmington, New Mexico. (April 2001). Ms. Lawson participated in fieldwork for a total of three days. She served as Field Crew for the survey, mapping, and surface collection of a small multicomponent site (early prehistoric Anasazi through late historic Navajo).

Publications and Presentations

- August 2014. A Peer Review of Structural capacity for social practice at the Palace of Gede, Kenya by Monika Baumanova and Ladislav Šmejda for African Archaeological Review
- Nevadomsky, Joseph, Natalie Lawson, and Ken Hazlett. An Ethnographic and Space Syntax Analysis of Benin Kingdom Nobility Architecture. African Archaeological Review. March 2014, Volume 31, Issue 1, pp 59-85
- SWAA 2001 Conference: TL Dating: Science of Authenticity
- SWAA 2002 Conference: Spatial Analysis of Benin Kingdom Architecture
- AAA 2002 Conference: Spatial Analysis of Benin Kingdom Palaces Southern California Academy of Sciences 2003 Conference: The Stone Tools of CA-ORA-840

Thomas A. Lae, P.G.

Geologist/Project Manager

Education

B.S., Geology. California State University, Fullerton

Professional Registrations

State of California Professional Geologist, License No. 7099

Relevant Experience

Mr. Lae has more than 25 years of experience in environmental geology that includes 15 years of project management and is a California Professional Geologist. Mr. Lae serves as a project or task manager on numerous projects for private, federal, and municipal clients. He has an extensive background in environmental field investigations. He has led Superfund site investigation projects; conducted remedial investigations/feasibility studies; obtained underground storage tank/oil water separator closures; monitored landfill groundwater; and conducted Phase II environmental assessments. He has also served as Section preparer or Sr. reviewer for over 25 power plant licensing projects for geologic hazards and resources.

Representative Projects and Dates of Involvement

Preparer; Geologic Hazards and Resources Sections; Electrical Power Plant Application for Certification, CA. Mr. Lae has authored or served as Sr. Geologist for the geologic hazards and resources sections for dozens of AFCs. These include the Mariposa Energy Project (Mariposa Energy, LLC), Almond 2 Power Plant (Turlock Irrigation District), East Altamont Energy Center (Calpine), Central Valley Energy Center (Calpine), Los Esteros Energy Center (Calpine), Cosumnes Power Plant (SMUD), Woodland II (Modesto Irrigation District), Modesto Electric Generation Station (Modesto Irrigation District), Walnut Energy Center (Turlock Irrigation District), San Francisco Electrical Reliability Project (San Francisco Public Utilities Commission), Highgrove (AES Pacific), Walnut Creek Energy Project (Edison Mission Energy), Sun Valley Energy Project (Edison Mission Energy), Eastshore Energy Project (Tierra), South Bay Energy Facility (Duke), Chevron Richmond Power Plant Replacement Project SPPE, Ivanpah Solar Electric Generating System (Bright Source Energy), Carlsbad Energy Center Project (NRG), Tracy Power Plant (GWF), Vacaville Energy Center (Competitive Power Ventures), Fontana Energy Center (Calpine) Lodi Energy Center (NCPA), Oakley Generating Station (Radback), Hidden Hills Solar Energy Generating Station (Bright Source Energy), Huntington Beach Energy Project (AES), Los Alamitos Energy Project (AES), Redondo Beach Energy Project (AES), and King Island CAES project (PG&E). Mr. Lae is well versed in the assessment of geologic resources and hazards relating to CEQA and NEPA requirements.

Expert Witness. Mr. Lae has served as an expert witness testifying for several power plant projects as part of the licensing process with the California Energy Commission. Mr. Lae has provided expert testimony on the subject matter of geologic resources and hazards relating to power plant construction and operations.

On-call Professional Geologist; California Energy Commission Hazardous Waste Remediation Oversight; CA. A part of construction of the PG&E's Gateway Generating Station (Antioch, CA), Colusa Generation Station (Colusa, CA), Lodi Energy Center (Lodi, CA), and Mariposa Energy Center, Mariposa, CA), Mr. Lae served as these projects' on-call professional geologist. His duties included the coordination of sampling, characterization, and remediation of hazardous waste materials (including asbestos, PCBs, and TPH) encountered during plant excavation activities. Mr. Lae provided summary reports upon completion of sampling and remedial activities for submittal to the CEC.

Task Order Project Manager; Superfund Site Investigation and Oversight; U.S. Environmental Protection Agency (EPA); CA. CH2M HILL provides support to the EPA (Region 9) for a number of task orders, with Mr. Lae currently serving as project manager. Active task orders include a former gold mine site in Nevada County, CA, impacted by past mining operations where Mr. Lae managed or manages three task orders including the O&M of a remedial action, mine water pilot treatment plant testing, and a feasibility study. In addition, at a rocket engine manufacturing and test facility impacted by solvent, fuel, propellant, and metals contamination, Mr. Lae manages an oversight task order that involves the review and comment of reports, white papers, technical memoranda, and studies that are submitted for EPA regulatory review. Mr. Lae also served as a project (site) manager for the Cooper Drum superfund site, located in Southgate, CA. This project involved the evaluation and remedial investigation of soil and groundwater contamination from past releases at a drum recycling center.

Groundwater Monitoring; City of Roseville, CA. Mr. Lae served as the project manager and the supervising geologist for the annual and semi-annual groundwater monitoring reports for the former sanitary landfill. Duties included planning sampling events, evaluation of laboratory data, preparation of graphics and tabular data, and report writing. Mr. Lae has also supported landfill gas studies at this site.

Project Manager; Groundwater and Soil Investigations; Union Pacific Railroad. Mr. Lae served as the project manager for several UPRR projects that included: a groundwater and soil TPH investigation at a former UST site (Donner Summit UST); an arsenic in soil assessment at a Right of Way (Clyde, CA), a TPH in soil site at Right of Way (Chico, CA), and nitrogen contamination in onsite soils (Willows, CA). Mr. Lae successfully received regulatory closure at all of these project sites.

Project Manager; Oil /Water Separator Closure Investigation; Beale Air Force Base; AFCEEE. Mr. Lae served as the project manager for two projects at Beale AFB in the evaluation for regulatory closure of 25 former oil/water separators across the base. The project includes the assessment of environmental impacts to underlying soil and groundwater from past releases and preparing closure documentation. Mr. Lae successfully received RCRA regulatory closure of 18 OWSs.

Project Manager; Remedial Investigation; Beale AFB, Various Sites; AFCEE. Mr. Lae has served as the project manager and currently supports remedial investigations and reporting for several sites at Beale AFB. This AFB has been impacted by past release of a variety of industrial contaminants from past Air Force operations. The project involves the evaluation of soil and groundwater contamination at numerous sites with many potential sources with the goal of site closure.

Project Manager; Underground Storage Tank (UST) and Oil Water Separator Investigation; U.S. Navy; Rough and Ready Island; Stockton, CA. Mr. Lae served as the project manager for three U.S Navy project sites at Rough and Ready Island, Stockton, CA. These projects involved the evaluation of soil and groundwater contamination at sites with underground storage tanks or oil water separators. Soil and groundwater samples were collected and analyzed to determine the presence or absence of contamination. Each of the three sites were successfully evaluated and a determination of "No Further Assessment" was received by the RWQCB.

Aarty Joshi

Role

Education

M.Sc.Pl., Planning, University of Toronto, Canada, 2000
B.Sc.Env., Environmental Science, University of Guelph, Canada, 1998

Professional Registrations

- Member, American Planning Association (APA)
- Certified Planner, American Institute of Certified Planners, 2005 (Registration No. 159391)

Distinguishing Qualifications

- Over 16 years of experience performing and managing land use evaluations, environmental permitting, and public involvement programs in the industrial, commercial/municipal, oil and gas, renewable energy, transportation and infrastructure sectors
- Extensive experience in environmental permitting for energy sector projects
- Experience in urban planning and industrial development

Relevant Experience

Senior Project Manager and environmental planner with CH2M HILL with over 16 years of experience managing land use evaluations and writing environmental impact assessment documents that comply compliance with NEPA and CEQA. Coordinates local, state, and federal regulatory processes for energy projects.

Representative Projects and Dates of Involvement

Project Manager; Golden Hills North Wind Energy Center; NextEra Energy Resources, LLC; Alameda County, California (2014-ongoing). Ms. Joshi is leading the environmental permitting, and CEQA processes for a repowering project that involves decommissioning up to 324 wind turbines and installation of up to 24 modern turbines with a nameplate capacity of 41.16-MW in the Altamont Pass Wind Resource Area. Development of the wind power project requires a Conditional Use Permit from Alameda County. Ms. Joshi is overseeing biological and cultural surveys, preparation of CEQA checklist pursuant to the County's programmatic EIR, and biological assessment and permit applications to U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW) and Regional Water Quality Control Board (RWQCB).

Project Manager; Golden Hills Wind Energy Facility Repowering Project; NextEra Energy Resources, LLC; Alameda County, California (2013-ongoing). Ms. Joshi led the environmental permitting, and CEQA processes for a repowering project that involved decommissioning up to 775 wind turbines and installation of up to 48 modern turbines with a nameplate capacity of 81.6-MW in the Altamont Pass Wind Resource Area. Development of the wind power project required a Conditional Use Permit from Alameda County. Ms. Joshi oversaw biological and cultural surveys, preparation of technical reports in support of the third-party Programmatic EIR, and biological assessment and permit applications to USACE, USFWS, CDFW and RWQCB. Ms. Joshi is currently supporting the applicant's acquisition of lands to satisfy state and federal permit mitigation requirements. Specifically, Ms. Joshi is leading CH2M's preparation of a biological baseline study and long-term management plan that would guide management of the mitigation lands.

Project Manager; Altamont Decommissioning Project; NextEra Energy Resources, LLC; Alameda County, California (2015-ongoing). Ms. Joshi is leading environmental permitting for the proposed decommissioning of up to 978 wind turbines and related infrastructure in the Altamont Pass Wind Resource Area. Ms. Joshi is overseeing biological surveys, preparation of technical reports, biological assessment and permit applications to USACE, USFWS, CDFW and RWQCB.

Project Manager; Alta East Wind Project; Terra-Gen Power, LLC; Kern County, California (2010-ongoing). Ms. Joshi oversaw the licensing and environmental permitting, and CEQA/NEPA processes for a 300-MW wind power project and 230-kV transmission line in the Tehachapi Wind Resource Area on privately-owned land under the jurisdiction of Kern County and federally-owned land under the jurisdiction of the Department of the Interior, Bureau of Land Management (BLM). Development of the wind power project required development and submittal of a Plan of Development to the BLM, and an Application for Rezone and Conditional Use Permit from Kern County. The work entailed biological and cultural surveys, evaluating potential project impacts, and identifying mitigation measures through consultations with CDFW, USFWS, BLM and Kern County, permit applications to CDFW and Lahontan RWQCB. Ms. Joshi is currently overseeing preparation of an Eagle Conservation Plan and Environmental Assessment in support of USFWS-authorization of an Eagle Take Permit.

Senior Consultant; Rising Tree Wind Farm; EDP Renewables, LLC; Kern County, California (2015-ongoing). Ms. Joshi is providing senior review and guidance on CH2M's preparation of an NEPA Environmental Assessment in support of USFWS-authorization of an Eagle Take Permit.

Project Manager; Addison Wind Energy Project; Terra-Gen Power, LLC; Kern County, California (2013). Ms. Joshi managed preparation of technical reports that were used in support of an Environmental Impact Report, prepared pursuant to the California Environmental Quality Act (CEQA) for a 100-megawatt (MW) wind power project and 230-kV transmission line in the Tehachapi Wind Resource Area. Development of the wind power project required development of an Application for Rezoning and Conditional Use Permit. Resource areas evaluated included air, visual, paleontology, and cultural resources.

Project Manager; Alta Infill I Wind Energy Project; Terra-Gen Power, LLC; Kern County, California (2010-2011). Ms. Joshi managed preparation of permit applications to the CDFW, and Lahontan RWQCB in support of development of a 271-megawatt (MW) wind power project in the Tehachapi Wind Resource Area.

Project Manager; Alta Infill II and III Wind Energy Projects; Terra-Gen Power, LLC; Kern County, California (2011-2012). Ms. Joshi managed the California Environmental Quality Act (CEQA) and environmental permitting process for a 600-megawatt (MW) wind power project and 21 miles of 230-kV transmission line in the Tehachapi Wind Resource Area. Development of the wind power project required development of an Application for Rezoning and Conditional Use Permit, and surveys and technical reports for all environmental resource areas to Kern County, as well as permit applications to CDFW, and Lahontan RWQCB. Ms. Joshi subsequently managed the preparation of an applicant-prepared Addendum to the Alta Infill II Supplemental EIR that evaluated the rezoning of additional land proposed for addition to the Alta Infill II's project boundary.

Deputy Project Manager; California Highwind Energy Projects (CHiPs) Infill Properties, Terra-Gen Power, LLC; Kern County, California (2010). Ms. Joshi led the preparation of an Application for Lot Line Adjustment to Kern County and supporting applicant-prepared EIR Addendum in the Tehachapi Wind Resource Area.

Task Leader; Shiloh II Wind Farm, Solano County, California (2006). For the Solano County Department of Resource Management, Ms. Joshi provided land use evaluations in support of the preparation of the

third-party EIR for a 168-MW wind energy facility proposed by Shiloh Wind Partners, LLC (owned by EnXco, Inc.), on about 7,900 acres of private land within the County's Montezuma Wind Resource Area.

Task Leader, Montezuma Wind Project, Solano County, California (2006). For the Solano County Department of Resource Management, Ms. Joshi developed the transportation section in support of the third-party EIR for this 37-MW wind project proposed by FPL Energy on a site adjacent to that of the Shiloh II Wind Farm.

Deputy Project Manager; 250-MW Solar Program; Pacific Gas and Electric Company, various locations, California (2008-2010). Ms. Joshi was Deputy Project Manager for PG&E's 250-MW solar program involving siting of solar energy projects up to 20 MW throughout California. Ms. Joshi oversaw development of a GIS model that evaluated more than 2 million parcels for suitability for solar development. Based on the results of the GIS modeling program, Ms. Joshi assisted PG&E with preparation of site-specific critical issues analyses that address aesthetics, agricultural, land use, biological, and cultural resources, as well as regulatory permit constraints.

Task Leader; Confidential Solar PV Project; Confidential Client, San Bernardino County, California (2009). Ms. Joshi led the analysis of desktop critical issues analyses for two potential solar photo-voltaic development sites in San Bernardino County. The critical issues analyses evaluated risks to development as a result of issues to land use, biological resources, cultural resources, aesthetics, geology, floodplain and Section 404 Clean Water Act, and hazardous wastes/materials.

Deputy Project Manager; 250-MW Solar Program; Pacific Gas and Electric Company, various locations, California (2008-2009). Deputy Project Manager for PG&E's 250-MW solar program involving siting of solar energy projects up to 20 MW throughout California. Ms. Joshi oversaw development of a GIS model that evaluated more than 2 million parcels for suitability for solar development. Based on the results of the GIS modeling program, Ms. Joshi is currently assisting PG&E with preparation of site-specific critical issues analyses that address aesthetic, agricultural, land use, biological, and cultural resources, as well as regulatory permit constraints. Ms. Joshi participates in weekly progress meetings with PG&E, coordinates extensively with the client team, assists in daily management activities, and maintains the secure, Web-based SharePoint communications site used by the client and the project team.

Deputy Project Manager; WaveConnect Projects; Pacific Gas and Electric Company; Eureka, California (2009-2010). Deputy Project manager for a 5-MW hydrokinetic pilot project located offshore of Eureka, Humboldt County, California. Ms. Joshi is assisting with preparation of a Hydrokinetic Pilot Project License Application before the Federal Energy Regulatory Commission (FERC) for this project, one of the first proposed to convert the ocean's energy to electrical power in the world. Ms. Joshi authored several sections of the Hydrokinetic Pilot Project License Application, including the Land Use and Recreation sections, as well as the Coastal Zone Consistency Analysis. Ms. Joshi participates in weekly progress meetings with PG&E, coordinates with the client and project team, and assists in daily management activities.

Task Lead; Almond Two Power Plant, Turlock Irrigation District; Ceres, California; December 2008 – March 2009. Prepared the land use analysis of a power plant for California Energy Commission (CEC) Application for Certification (AFC). Analyzed land use impacts, prepared the draft chapter, and responded to comments and questions from the CEC.

Senior Review; Alta Gas Irish Energy Project, Blythe, California (2014). Oversaw preparation of land use analysis of a power plant for California Energy Commission (CEC) Application for Certification (AFC).

Cindy L. Salazar

Project Manager/ Environmental Planner/Operations Leader

Education

M.S., Environmental Management, University of San Francisco, 2003
B.S., Applied Ecology, University of California, Irvine, 2000
The School for Field Studies, Queensland, Australia, July-August 2000

Professional Registrations

Professional Engineer: California (initial year issued, No. #), Illinois (initial year issued, No. #), and Michigan (initial year issued, No. #)

Relevant Experience

Ms. Cindy Salazar is an Environmental Planner with 14 years of experience in writing Environmental Impact Reports (California Environmental Quality Act), Environmental Impact Study (National Environmental Policy Act). She has experience in Initial Studies, Negative Declarations, Mitigated Negative Declarations, Proponents Environmental Assessments, and Preliminary Environmental Assessment Reports.

Representative Projects and Dates of Involvement

Deputy Project Manager; SR 79 Realignment; RCTC; (2007 - current). The State Route 79 Realignment Project will realign SR 79 from Domenigoni Parkway to Gilman Springs Road in the cities of Hemet and San Jacinto and unincorporated Riverside County. Direct coordination with various technical leads; cooperating agencies, and Caltrans. Assisted with the Draft EIR/EIS in February 2013 and Partially Recirculated Draft EIR/EIS in August 2015 for public circulation. The project is in the current stages of the Final EIR/EIS.

Deputy Project Manager, Confidential Project (March 2012 – ongoing). Deputy Project Manager for Application for Certification (AFC) to the California Energy Commission to construct and operate a power generation facility for three locations in Southern California.

Associate Planner, Whittier Narrows Environmental Assessment Report (2013). Primary author of Land Use, Energy and Noise sections and overall review of the EA.

Associate Planner, Davis Street Initial Study/Negative Declaration (September 2010). Primary author of the Land Use section and review of IS/ND.

Associate Planner, Kettleman Hills Facility B-18 Re-Grade Environmental Evaluation Amendment (September 2010). Completed environmental evaluation for Department of Toxic Substance Control, specific to re-design of the engineering of the proposed expansion of the B-18 Landfill.

Associate Planner; Draft and Final Subsequent Environmental Impact Report for the B-18/B-20 Hazardous Waste Project, Kettleman Hills Facility; Chemical Waste Management, Inc.; (2009). Coordinated directly with Kings County Planning Agency to address comments received from public circulation. Primary author of Land Use, Transportation and Traffic, Noise, and Aesthetics sections.

Associate Planner; Southern California Edison Triton PEA; SCE; (2008). SCE proposes to construct the Triton Substation Project on an approximately ten-acre vacant parcel of land in the City of Temecula. Primary author of Population and Housing and Noise.

Associate Planner; U.S. Department of Homeland Security, U.S. Customs and Border Protection, U.S. Border Patrol; (2007-2008). Pursuant to a 2006 Presidential mandate to hire 6,000 new United States

(U.S.) Border Patrol (USBP) agents, the U.S. Department of Homeland Security (DHS), U.S. Customs and Border Protection (CBP) proposes to expand USBP stations.

- Alamogordo EA - Primary author of Socioeconomics, Environmental Justice & Protection of Children and Utilities & Infrastructure
- Customs and Border Patrol: Las Cruces EA - Primary author of Environmental Justice & Protection of Children
- Customs and Border Patrol: Blythe EA - Primary author of Socioeconomics, Environmental Justice & Protection of Children and Utilities & Infrastructure
- Kettleman Hills Facility B-18/B-20 Hazardous Waste Disposal Project Draft SEIR - Coordinated directly with Kings County Planning Agency and client; coordinated the distribution (120 copies) of document for public review; responded to questions from client

Associate Planner; City of Los Angeles Department of Water and Power Aquifer Storage and Recovery; County of Los Angeles Public Works; (2007). The Antelope Valley Aquifer Storage and Recovery Project (Project) proposes to install two additional aquifer storage and recovery (ASR) drinking water wells at the District's new Lancaster Headquarters and Warehouse. Primary author of Initial Study/ Mitigated Negative Declaration.

Associate Planner; Tehachapi Renewable Transmission Project; Southern California Edison; (2007). White paper on Applicant Proposed Measures. Primary author of Proposed Applicant Proposed Measures.

Associate Planner; Southern California Edison Tehachapi Renewable Transmission Project; Southern California Edison; (2007). Southern California Edison's (SCE) Tehachapi Renewable Transmission Project (Project or TRTP) includes a series of new and upgraded high-voltage electric transmission lines and substations to deliver electricity from new wind farms in eastern Kern County, California, to the Los Angeles Basin. The Project will provide the electrical facilities necessary to integrate levels of new wind generation in excess of 700 megawatts (MW) and up to approximately 4,500 MW in the Tehachapi Wind Resource Area (TWRA). Visual Technical Report/PEA Section - Data collection of visual goals and policies for approximately 40 jurisdictions, visual fieldwork, and assisted with writing and coordination of Visual Technical Report and PEA Section. Noise Technical Report/PEA Section - Set up noise monitoring stations and assisted with writing and coordination of Noise Technical Report and PEA Section.

Associate Planner; Draft Environmental Impact Report for Chiquita Canyon Landfill; Republic Services; (2006; 2010). The Project would provide disposal capacity to help meet the critical solid waste management needs of Los Angeles County. Primary author of Socioeconomic/ Environmental Justice, Hazardous Waste, Land Use and Planning and updated Noise and Community Impact section per updated project description.

Associate Planner; Schuyler Heim Bridge Replacement and SR-47 Expressway Project Environmental Impact Statement/Environmental Impact Report. Alameda Corridor Transportation Agency; (2006). The project involves replacement of the existing Schuyler Heim Bridge, construction of a new SR-47 Expressway to provide a high-capacity alternative route along the Alameda Corridor for traffic between Terminal Island and Alameda Street at Pacific Coast Highway, and construction of a flyover that would divert eastbound Ocean Boulevard traffic directly onto northbound SR-47 and across the new bridge. Primary author of Energy Section.

Staff Planner; Draft Environmental Impact Report for Berth 206-209 Interim Container Terminal Reuse Project; Port of Los Angeles; (2003 – 2004). The project is to continue container terminal operations at the Port of Los Angeles. Assisted with the distribution and coordination of document.

Experience Prior to CH2M

TRC Environmental Solutions, Inc. Environmental Scientist I (August 2001 – September 2003):

- Reviewed an Application for Certification (AFC) for the construction of a combined-cycle electric power plant for data adequacy.
- Compiled project information for California Energy Commission (CEC) AFC for the proposed construction of four new peaking power plants, permitted under the California Emergency Power Plant Permitting Process. Sections prepared address the socioeconomic aspects.
- Response to comments for the Final Environmental Impact Report of an expansion of the Tajiguas Landfill.
- Prepared Socioeconomic Resource Report for a Storage Expansion and Reliability Improvement Project for a natural gas pipeline
- Phase I Site Assessment for Petsmart in North Las Vegas, Nevada.
- Assisted with site investigations and coordinated the preparation of Spill Prevention, Control and Countermeasure Plans for 174 sites throughout San Diego County.
- Assisted with site investigations and preparation of Storm Water Pollution Prevention Plan for construction sites throughout San Diego County.

Publications and Presentations

Acknowledged in the research article: Generation of Enterococci Bacteria In A Coastal Salt Marsh And Its Impact on Surf Zone Water Quality. 2001. *Environmental Science & Technology*. 35: 2407-2416.

Mark Bastasch, P.E., INCE

Environmental Engineer, Noise Assessment

Education

M.S., Environmental Engineering
B.S. (cum laude), Environmental Engineering

Professional Registrations

- Professional Acoustical Engineer: Oregon
- Professional Environmental Engineer: Oregon (No. 58990EN) Professional Civil Engineer: Oregon, 1999 (No. 58990PE)
- Certified Water Rights Examiner (CWR): Oregon, 2000 (No. 58990CWRE)

Originations/Affiliations

Member, Institute of Noise Control Engineering
Member, Acoustical Society of America

Relevant Experience

Mr. Bastasch is a registered acoustical engineer with 16 years of experience conducting acoustical evaluations, environmental audits, contamination assessments, and multimedia environmental permitting. For the past decade, Mr. Bastasch has provided technical insight, forethought and leadership on acoustical matters to the renewable power industry and its partners and has been an invited speaker to organizations such as Harvard Law School/Consensus Building Institute, USDOE's Wind Powering America, International Energy Agency/USDOE's National Renewable Energy Laboratory, the National Wind Coordinating Council, Law Seminars International, American Wind Energy Association, USDOE's New England Wind Energy Education Project and with officials in Japan. His power permitting and design experience spans the United States and he has supported multiple EPC efforts both domestic and internationally which have fully complied with applicable regulatory limits.

Representative Projects and Dates of Involvement

Lead Acoustical Engineer; Edison Mission Energy's GE LMS100 Peaking Facilities; Southern California. Led acoustical tasks on two simple cycle power facilities each utilizing 5 GE LMS100 combustion turbines in simple cycle. Tasks included evaluating and measuring background noise levels to determine and evaluate risk associated with potential CEC permit limits; extensive coordination with GE given limited available data resulting from short operating history of the LMS100 (these were the first LMS100 evaluated in California); preparing Application for Certification to the CEC. Additional tasks included development and review of acoustical bid and guarantee specifications for cooling towers, SCR, stack, transformers, and other balance of plant equipment. Developed a phased mitigation program to minimize cost and mitigate acoustical risk given limited operating history similarly packaged LMS100s

Acoustical Engineer; Los Esteros Critical Energy Facility, San Joaquin Valley Energy Center, East Altamont Energy Center, Delta Energy Center; Calpine Corporation; California. Conducted detailed environmental noise survey to demonstrate that this simple cycle LM6000 facility complied with its conditions of certification. Report was accepted by the California Energy Commission without comment.

Lead Acoustical Engineer; Walnut Energy Center; Turlock Irrigation District; Turlock, California. Led acoustical tasks for a combined cycle power plant that included evaluating and measuring background noise levels; developing detailed noise model; comparing expected noise levels with the City of Turlock,

County of Stanislaus, and the CEC's noise guidelines; preparing Application for Certification and subsequent amendments submitted to the CEC; regulatory negotiation; and reviewing Conditions of Certification.

Additional tasks included development assistance with acoustical bid and guarantee specifications and independent analysis of manufacturer steam turbine generator enclosure.

Lead Acoustical Engineer; BrightSource Energy; Ivanpah Solar Electric Generating System. Authored noise section of California Energy Commission Application for Certification. Successfully worked with CEC staff to streamline noise analysis and eliminate unnecessary field studies given remote project site and lack of noise sensitive receptors.

Lead Acoustical Engineer; MEGS; Modesto Irrigation District; Ripon, California. Led acoustics for a LM6000 (Norway package) power plant. Tasks included evaluating and measuring background noise levels; coordinating measurements of operating Norway Package with General Electric; developing detailed noise model; comparing expected noise levels with the City of Ripon, County of Stanislaus, and the California Energy Commission's (CEC) noise guidelines; preparing Application for Certification and subsequent amend- ments submitted to the CEC; regulatory negotiation; and review of Conditions of Certification, testimony at CEC evidentiary hearings.

Lead Acoustical Engineer; Eastshore Power Project; Tierra Energy; Hayward, California. Evaluated and measured background noise levels to determine and evaluate risk associated with potential CEC permit limits and prepared application for certification to the CEC. Reviewed available vendor data and commitments. The facility is a 115.5-MW simple cycle power plant consisting of 14 Wärtsilä 20V34SG natural-gas-fired reciprocating engine generators and associated equipment.

Lead Acoustical Engineer; Humboldt Bay Repowering Project; Pacific Gas & Electric; Humboldt, California. Evaluated and measured background noise levels to determine and evaluate risk associated with potential CEC permit limits; prepared application for certification to the CEC, conducted site tour with CEC's acoustical staff and reviewed of existing EPC commitments. Facility is a load following power plant consisting of

10 natural gas-fired Wärtsilä 18V50DF 16.3 megawatt (MW) reciprocating engine-generator sets and associated equipment with a combined nominal generating capacity of 163 MW.

Project Manager/Lead Acoustical Engineer; Calpine GE LM6000 Peaker Program; Calpine Corporation; Dublin, California. Prepared California Environmental Quality Act level noise assessments for more than 10 LM6000-based peaking power plants located throughout northern California. Developed a flexible and streamlined program to accurately and quickly prepare acoustical assessment. Tasks included regulatory review and interpretation of city and county noise standards, ambient measurements and analysis, development of a standardized model that included several levels of optional mitigation and field verification at operating facilities, and regulatory negotiations.

Lead Acoustical Engineer; Cosumnes Power Plant, Sacramento Municipal Utility District, California. Led acoustical tasks on this two-phase, 1,000-MW combined-cycle power plant on buffer lands for the former Rancho Seco Nuclear Plant. Prepared AFC, worked with SMUD legal counsel and permitting team to address intervener comments. Alternative mitigation measures were developed in consultation with CEC Staff to establish acceptable Conditions of Certification Application for Certification for combined-cycle gas fired generation facility. Prepared amendments to include a natural gas transmission line and required gas compressors. Expert witness testimony before California Energy Commission.

Lead Acoustical Engineer; Licensing and Permitting for San Francisco Electric Reliability Project (SFERP); San Francisco Public Utilities Commission. Led acoustical tasks to develop a 145-MW simple-cycle plant

in southeast San Francisco, using three LM 6000 turbines. Because plant is located two blocks south of an existing plant, major issues included remediation of the power plant site (contaminated fill), air quality mitigation measures, water supply, environmental justice, and the need for in-citygeneration.

James Verhoff

Paleontologist

Education

B.S., Geology (specialization in Paleobiology), Bowling Green State University, 2006
Paleontology graduate work, Kent State University, 2006 to 2008

Professional Registrations

- Sigma Gamma Epsilon
- Geological Society of America

Distinguishing Qualifications

- Site Safety Coordinator-trained
- OSHA 40-hour Hazardous Waste Operations and Emergency Response-trained
- OSHA 10-hour Construction Safety-trained
- Training in paleontology

Relevant Experience

James Verhoff is a Staff Paleontologist with CH2M HILL. He earned his Bachelor's Degree in Geology, specializing in Paleobiology, at Bowling Green State University, and did graduate work at Kent State University. While at Kent State he assisted in field surveys in Ohio, Romania, and Austria, as well as obtaining a strong background in stratigraphy through coursework at both institutions. With CH2M HILL he has served as the project paleontologist for projects in California and Nevada. He has developed paleontological inventory reviews and paleontological monitoring and treatment plans, which complied with NEPA, CEQA, and where appropriate the requirements of the California Energy Commission and BLM, for NODOS, Devers-Palo Verde 2, the California High Speed Rail, and a number of wind and solar power plants, as well as assisting with other projects in both California and Nevada. He has conducted paleontological surveys in Riverside and Los Angeles Counties, and acted as paleontological monitor for a number of construction projects. Representative Projects

Representative Projects and Dates of Involvement

Lead Paleontologist; Devers-Palo Verde Line 2; Riverside County, California. Performed the paleontological resources literature review and records search, conducted the field reconnaissance, survey of paleontologically sensitive formations, and prepared the Paleontological Monitoring and Treatment Plan for the construction of a 500 kV transmission line and associated facilities.

Paleontological Field Director; Alta East Wind Project; Alta East Windpower Development, LLC; Kern County, California. Assisted in writing the Paleontological Resources Technical Memorandum, including performing the literature and records review for paleontological resources, and assisted with U.S. Bureau of Land Management permitting of this project. Supervised the implementation of the PRMMP and on-site paleontology monitoring activities, including microfossil sampling, staffing, and client communications. Wrote the final Paleontological Resources Report for this project.

Paleontological Field Director; Rising Tree Wind Project; Kern County, California. Assisted in writing the Paleontological Resources Technical Memorandum, including performing the literature and records review for paleontological resources, and assisted with U.S. Bureau of Land Management permitting of this project. Supervised the implementation of the PRMMP and on-site paleontology monitoring activities, including microfossil sampling, staffing, and client communications. Wrote the final Paleontological Resources Report for this project.

Staff Paleontologist, Hidden Hills Solar Energy Generation Station and Utility Corridor, BrightSource Energy, Inyo County, California and Clark and Nye Counties, Nevada. Wrote the Paleontological Resources Technical Memorandum, which outlined the records and literature review for paleontological resources, for the solar power plant and performed reconnaissance-level field surveys, as per BLM requirements, of both the solar power plant and the utility corridor.

Staff Member; TGP Northern Nevada Powerline Alternatives; Clark and Nye County, Nevada. Performed the paleontological records literature review and records search, and assisted in writing the subsequent Paleontological Resource Assessment Technical Memorandum.

Staff Member; California High Speed Train; California High Speed Rail Authority; California. Performed the paleontological resource literature review and wrote and assisted in editing the Paleontological Resources Technical Plan for the construction of the California High Speed Rail.

Staff Member; Russell City Energy Center Project; Russell City Energy Center; California. Performed the paleontological records review and wrote first draft of the Paleontological Resource Monitoring and Mitigation Plan.

Staff Member; NODOS Reservoir Project; Department of Water Resources; California. Performed the paleontological resource literature review and wrote and assisted in editing the Paleontological Resource Monitoring and Mitigation Plan and EIR for the construction of a new reservoir and related facilities.

Staff Member; GWF Henrietta Solar PV Project; GWF Power Systems; Kings County, California. Performed the paleontological resources literature review and wrote the Paleontological Resource Monitoring and Mitigation Plan, and pre-construction survey of the site.

Task Lead; Santa Susan Flight Laboratory; NASA; Ventura County, California. Tasked with coordinating the requirements for completing the paleontology portion of the EIS (still in production). This included a literature and records review, as well as ensuring the task remained on time and within budget. This work is ongoing.

Staff Member; Almond 2 Power Project; PG&E; California. Assisted in writing the Paleontological Monitoring and Mitigation Plan. Also acted as Paleontological Resources Monitor, which included collecting paleontological resources and reporting the find.

Field Team Lead; Keesler Air Force Base Groundwater Survey; Keesler Air Force Base; Biloxi, Mississippi. Was in charge of a four-person team responsible for completing site-wide ground water sampling, and performed a benthic faunal survey in the near-by waterway. This included being responsible for coordination with Air Force personnel and facilities.

Field Team Lead; Master Cleaner's Groundwater Survey; Master Cleaner's Dry Cleaners; Mobile, Alabama. Was in charge of a four-person team responsible for soil sampling, site characterization, and plume delineation, and assisted in writing the proposed remediation plan. This survey was conducted with a DPT-technology equipped GeoProbe drill rig.

Field Team Lead; NASA groundwater survey; Marshal Space Flight Center; NASA; Huntsville, Alabama. Included surface and subsurface soil sampling, groundwater and surface water sampling, and sediment sampling, including multiple well types, soil surveys conducted with hand augers and DPT-equipped GeoProbe drill rigs, and sampling springs. This work also required awareness of UXO and other similar hazards. This work also includes management of multiple teams during large field efforts in potentially hazardous areas.

Field Team Member; AFP6 Groundwater Survey, Air Force Plant 6; United States Air Force; Marietta, Georgia. Assisted in sitewide groundwater sampling.

Field Team Member; Walder Coke Soil Survey; Walder Coke; Birmingham, Alabama. Included off-site surface soil sampling.

Fatuma Yusuf

Senior Economist

Education

Ph.D., Agricultural Economics, 2000, Washington State University, Pullman, WA
M.S., Statistics, 1999, Washington State University, Pullman, WA
M.A., Agricultural Economics, 1994, Washington State University, Pullman, WA B.S., Range Management, 1990, University of Nairobi, Nairobi, Kenya

Distinguishing Qualifications

- Expert in resource and regional economics
- Experienced in providing economic analysis, including benefit-cost analysis, cost allocation, project feasibility and economic impact analysis, for federal, state, and local agencies.
- Experienced in socioeconomic and environmental justice analysis
- Experienced in statistical analysis and international economic development

Relevant Experience

Dr. Yusuf is an economist and statistician with over 15 years of experience. She has conducted economic analyses for energy, water supply, water quality, agriculture, transportation, and recreation projects; evaluated project feasibility; and assessed economic impacts associated with project implementation. She has experience in preparing the socioeconomic analysis, regional economic impact analysis, cost-benefit analysis, and rate impact analysis. She has developed statistical predictive models and has evaluated the economic impacts associated with base closures and habitat creation. She has been an economics task lead and task manager for a number of Environmental Impact Statements/Reports (EIS/R) including some on highway development or expansion, high speed rail development, and light rail development as well as on a number of important projects related to water resource issues.

Representative Projects and Dates of Involvement

Socioeconomics Lead; Application for Certification; Huntington Beach Energy Project; AES Southland Development LLC; Huntington Beach, CA. Managed the preparation of the socioeconomics resources section of an AFC for a 1,185-MW combined cycle repower of the existing Huntington Beach Generating Station located in Huntington Beach, CA. The analysis included the local and regional economic and socioeconomic impacts associated with the construction and operation of the project. Also, evaluated the Environmental Justice impacts associated with project implementation.

Socioeconomics Lead; Application for Certification; Alamitos Energy Center; AES Southland Development LLC; Long Beach, CA. Managed the preparation of the socioeconomics resources section of an AFC for a 1,950-MW combined cycle repower of the existing Alamitos Beach Generating Station located in Long Beach, CA. The analysis included the local and regional economic and socioeconomic impacts associated with the construction and operation of the project. Also, evaluated the Environmental Justice impacts associated with project implementation.

Socioeconomics Lead; Application for Certification; Redondo Beach Energy Project; AES Southland Development LLC; Redondo Beach, CA. Managed the preparation of the socioeconomics resources section of an AFC for a 546-MW combined cycle repower of the existing Redondo Beach Generating Station located in Redondo Beach, CA. The analysis included the local and regional economic and socioeconomic impacts associated with the construction and operation of the project. Also, evaluated the Environmental Justice impacts associated with project implementation.

Application for Certification for a number of energy projects including the San Francisco Electric Reliability Project in San Francisco, CA, the Walnut Energy Facility in Turlock, CA and the Ivanpah Solar Electric Generating System (Ivanpah SEGS) in San Bernardino County, CA. Economics Task Lead. Prepared the socioeconomics analysis section of the AFC. Also, analyzed the regional economic impacts of the project on employment and income.

Industrial Siting Application for a number of energy projects including the Medicine Bow Coal-to-Liquids Project, WY, Glenrock Wind Energy Project, WY and Dave Johnson. Analyzed the regional economic impacts of the project on employment and income.

Socioeconomic Study Plan for the SMUD Upper American River Project Iowa Hill Pumped Storage Development Project. Socioeconomic Task Lead. Prepared the socioeconomic study plan and evaluated the socioeconomic impacts associated with the Iowa Hill Pumped Storage Development Project as part of the Sacramento Municipal Utility District (SMUD) Upper American River Project Hydroelectric FERC relicensing application. Also, analyzed the regional economic impacts of the project on employment and income.

Revision of SMUD Upper American River Project Socioeconomic Impact Study Report. Socioeconomic Task Lead. Prepared Revision 1 of the SMUD UARP Socioeconomic Impact Study Report on the SMUD Upper American River Project Hydroelectric FERC relicensing. Revision 1 involved the verification of the study conducted by CSUS. Also, analyzed the regional economic impacts of the project on employment and income.

Klamath Hydroelectric Project Resources Studies and Preparation of Relicensing Documents, PacifiCorp, Upper Klamath River, Oregon and California. Prepared the Socioeconomic Resources Final Technical Report in support of the FERC application for a new Project license.

Statewide Flood Management Planning Program. Economist. On-going project. Reviewed alternative funding mechanisms that would be more economical for California state residents. The statewide flood program would be in place of the current FEMA administered National Flood Insurance Program (NFIP).

Economic Impact Analysis for the Elk Heights Composting/Digestion, Kittitas County, WA. Project Manager **and** Economics Lead. Provided screening-level economic, socioeconomic and fiscal impact analyses of the construction and operation associated with the Elk Heights Composting/Digestion project in Kittitas County, Washington.

Economic Impact Analysis for the Teanaway Solar Reserve, Kittitas County, WA. Economics Task Lead. Provided screening-level economic, socioeconomic and fiscal impact analyses of the construction and operation associated with the Teanaway Solar Reserve project in Kittitas County, Washington.

Market Assessment of Additional Power Generation on Ute Mountain Ute Reservation, New Mexico. Economics Task Lead**.** Analyzed the market for future power supply and demand to determine the feasibility of developing additional power generation capability on the New Mexico portion of the Ute Mountain Ute Reservation.

Economic Analysis for the Calpine LNG Facility and Power Plant in Eureka, CA. Project Manager and Economics Lead. Provided a screening-level economic, socioeconomic and fiscal impact analyses of the construction and operation associated with the Calpine LNG and Power Plant Projects in Eureka, CA.

Agricultural Impact Study of the PacifiCorp's Hydroelectric Power Project. Analyzed the socioeconomic and regional economic impacts associated with the increased energy costs faced by Klamath irrigators. Prepared the regional economic impact report.

Steven Long

Environmental Scientist

Education

M.S., Soil Science, Texas A&M University, College Station
B.S., Forest Resources, University of New Hampshire, Durham

Professional Registrations

Professional Wetland Scientist (PWS No. 2308) Society of Wetland Scientists;

Registered Environmental Property Assessor (REPA No. 753125), National Registry of Environmental Professionals

Relevant Experience

With more than 30 years of professional experience as an environmental scientist, Mr. Long is responsible for a wide range of tasks associated with natural resource and hydrogeologic environmental evaluations. Duties include field data collection and mapping in support of development projects and large-scale ecological risk assessments. Manages multiple environmental and compliance projects and prepares proposals and reports.

His natural resource experience includes evaluation of wetland systems, including delineation and documentation of wetlands by federal and state criteria in California, Nevada, Washington, Connecticut, Massachusetts, New York, New Hampshire, and Maine; evaluation of project constraints and development of alternate strategies for local, state, and federal permitting.

Hydrogeological experience includes in-field testing of soil, soil gas, and groundwater samples using portable gas chromatograph; in-situ aquifer permeability testing; monitoring subsurface explorations and installations (monitoring wells, piezometers and vapor extraction systems); environmental sampling and analytical testing; and development of contaminant transport hydrogeologic models. Mr. Long possesses strong skills in onsite chemical testing; description and taxonomic classification of soils, vegetation, and insects; permitting of wetland activities; and statistical analyses of groundwater analytical data.

Representative Projects and Dates of Involvement

Santa Susana Field Laboratory, NASA, Ventura County, California. Completed mapping of habitat and wetlands/waters of the U.S. and State for 440-acre parcel associated with NASA-administered facilities in the Santa Maria Mountains. Also supported additional biological and rare plant surveys and provided senior review for EIS biological resources section and Section 7 Biological Assessment associated with planned remediation activities.

Beale AFB, U.S. Air Force, Yuba County, California. Managed environmental permitting and compliance in support of a large ($38 million) performance-based remediation program. Completed wetland delineations for fifteen sites encompassing approximately 1,000 acres encompassing large vernal pool complexes. Between 2004 and 2010, managed Triad investigation of groundwater contamination from an unknown spill source and also prepared a large remedial investigation of the Cantonment Area portion of the base that encompassed several individual sites in a geologically complex area at the transition from the Sierra foothills to the Central Valley basin. Also prepared work plan for Long-Term Operation and Maintenance Program and managed six biovent remediation systems that focused on fuel product clean up. Oversaw completion of *in situ* respiration testing and semi-annual efficiency reporting for the biovent systems.

Union Pacific Railroad Company, Multiple Projects in CA, Arizona, and Arkansas. Ongoing project manager for multiple environmental compliance projects for this client. Since early 2010s, provided environmental compliance support for multiple projects in the Mojave Desert region of California and Arizona related to storm water damage repairs, double-tracking, watercourse crossings, sand dune encroachment, and Endangered Species Act compliance for desert tortoise, desert pupfish, and other listed wildlife and plants. Also provided environmental compliance support for multiple bridge replacement projects in the Central Valley region of California related to wetlands and waters of the U.S. and protection of multiple species under the Endangered Species Act. Monitored and documented vegetation re-growth over a 4 year period for a constructed wetlands at a rail yard remediation site adjacent to the Feather River in Portola, California. Conducted initial site walk to assess wetland impacts and permitting needs for a rail yard improvement project near Pine Bluffs, Arkansas. In the early 2000s, developed work scope and proposal for preliminary reconnaissance of jurisdictional wetlands for railway yard (area was 6.5 miles long by 1.5 miles wide) in Roseville, California. Conducted field work to document the different wetland types and prepared technical memorandum. Secured permit for proposed regrading activities from the Corps of Engineers. Participated in delineation field review with regulators.

Riparian Vegetation Replanting Plan, City of Tracy, California Waste Water Treatment Plant Expansion Project. Prepared a vegetation replanting plan and contractor planting specifications to satisfy regulatory agency permit requirements from the U.S. Fish and Wildlife Service and the California Department of Fish and Wildlife. The replanting plan provided specific requirements and performance monitoring for native riparian tree, shrub, and herbaceous plants over the course of the project.

Wetland Delineation, Proposed Wastewater Treatment Plant, Centralia, Washington. Completed fieldwork and prepared wetland delineation report for proposed municipal wastewater treatment facility that included new plant site, 8-mile forced main, and outfall. The force main pipeline alignment traversed areas within the floodplain of the Chehalis River and crossed through a public park and sensitive tree resource area. Assisted with evaluation of pipeline crossing alternatives and alignments.

Riparian Corridor Assessment, Guadalupe River, San Jose Airport, California. Completed fieldwork, mapping, and technical report for the riparian corridor associated with the Guadalupe River as it passes along the northern margin of the San Jose International Airport. The riparian corridor assessment was undertaken in accordance with local riparian ordinance to document sensitive biological resources that could be affected by a proposed rental car parking structure and associated bridges for vehicle and personnel access.

Riparian Corridor Assessment and Tree Mitigation Planting Plan, South San Jose, California. In accordance with local riparian ordinance, documented significant trees on proposed power plant site (Metcalf Energy Center). Field work consisted of tagging trees and measuring (DBH, height, and crown diameter), as well as recording qualitative information on vigor or condition of the trees. The surveyed tree locations were rendered onto a site map that was used to determine the impacts to riparian trees and determine tree mitigation requirements. Prepared the riparian tree mitigation planting plan to address the requirements for the proposed impacts.

Chevron Chemical, Richmond, California. Completed qualitative vegetation survey along the Castro Creek Corridor within and downgradient of the Chevron Chemical plant facilities. Characterized plant communities, cover, and condition as part of periodic biological monitoring efforts. Also supported the aquatic biological assessments (i.e., fish trapping) within Castro Creek during the same site visit.

Conducted a delineation of waters of the U.S. in a tidal marsh as part of a site remediation for arsenic contamination. Determined the extent of area where wetland plant, hydrology, and hydric soils indicated the limit of jurisdictional wetlands. In addition, conducted a study of tidal flooding within the

marsh basin to estimate the mean high water elevation that would also be considered jurisdictional under the Section 10 Harbors Act. Responsible for evaluating source materials and screening criteria for the salt marsh restoration of Castro Creek. Worked with San Francisco Bay Regional Water Quality Control Board project manager to get approval for the clean fill materials.

Solano County Water Agency, California. Conducted a delineation of waters of the U.S. along a proposed pipeline bypass around a potential landslide area. Wetlands also delineated in proximity to proposed upgraded flood control structures for the South Putah Irrigation Canal. Prepared a delineation report documenting the results of the field investigations to facilitate consultations with the U.S. Army Corps of Engineers. Also evaluated threats to endangered species by pesticide applications on a county-wide basis in support of the habitat conservation plan for a water use contract renewal. Evaluated pesticide use and monitoring programs in various county agricultural and public works agencies. Devised methods to identify the pesticide compounds of greatest threat and compare toxicity to various species of particular concern based on method and timing of applications and habitat/life cycle conditions. Developed best management practice guidelines for aquatic weed and rodent control activities to reduce or prevent impacts to non-target species by integrating recommendations from various sources.

Tulare Irrigation District, Biological Assessment, Tulare County, California. Completed biological assessment of plant and animal resources along a ten-mile section of the irrigation canal in support of a project to line the section with concrete. Prepared the Biological Resources section of the Environmental Impact Statement with input from senior wildlife biologist. Completed inventory of Valley oaks and elderberry shrubs along the canal. Completed habitat conservation plan for incidental impacts to endangered species – Valley elderberry longhorn beetle and San Joaquin kit fox. Participated in Section 7 consultations with the U.S. Fish and Wildlife Service and obtained incidental take permits for the above-listed species.

Glenn-Colusa Irrigation District, Wetland Delineation, Glenn County, California. Completed wetland delineation and report in proximity to a proposed canal siphon structure beneath Stony Creek. Supervised and documented transplantation of elderberry shrubs at a nearby mitigation site.

City of Mesquite, Wetland Delineation, and Constructed Wetland Monitoring, Nevada. Developed work scope and proposal for jurisdictional wetland delineation of city-owned, 18-acre property along Virgin River. Conducted field work to document the delineation and prepared technical memorandum. Adapted Point-Intercept method for yearly monitoring of vegetative cover for constructed wetlands at local golf course. Prepared and submitted annual monitoring report to USACE.

City of Boulder City, Nevada. Developed work scope and proposal for jurisdictional wetland delineation of city-owned, 40-acre property that was a proposed site for a State Veterans Facility. Conducted field work to document the delineation of the waters of the U.S. and prepared the delineation report. Consulted with the U.S. Army Corps of Engineers to assist in permit approval.

Lava Cap Mine, Nevada City, California. Developed work plan and SAP for an ongoing evaluation of a mine tailing release. Completed field collections of environmental media that will be used to complete a remedial investigation (RI) and a human and ecological risk assessment for downgradient receptors. The phased field sampling program included biota, surface soil, surface water, sediment, and groundwater samples from domestic wells. The program required interaction and coordination with the site owners and with residents of downgradient properties, as well as USEPA field auditors.

Tatalina Radar Station, Risk Assessment and Remedial Investigation, Alaska. Conducted seven week field program to sample soils, sediment, surface water, and groundwater to assess IRP sites under the Air Force Center for Environmental Excellence (AFCEE) program. Responsible as site safety coordinator and conducted on-site training for field sampling crew. Drafted major sections of the RI report including

the field sampling methodology, environmental setting, conceptual site model, RI site summaries, and baseline ecological risk assessment.

City of Tracy, Food Processing Water Irrigation Project, California. Conducted field investigations to characterize soil conditions for approximately 675 acres of irrigated farmland. The information was used to design an irrigation system to use food processing water from a nearby tomato production facility. Field tasks included detailed test pit descriptions of representative subsurface (to 10 ft. depth) soil conditions (such as field texture, horizonation, consistency, rooting, and porosity). In addition, surface water infiltration tests were conducted at select test pit locations. Prepared technical memorandum.

L-Bar Soil, Plant, and Crop Yield Evaluation, Washington. Conducted statistical analyses to determine the effect of groundwater contamination from minespoil leachate on soil, plant, and crop yield data. Two-way ANOVA (orthagonal comparison) methods were used to determine if position within the groundwater plume and topography showed an interaction effect. Drafted technical memorandum.

Vegetation Mapping, Lower Colorado River, Nevada, California, and Arizona. Participated in two rounds (separate years) of ground-truthing missions to verify vegetation mapping completed by the U.S. Bureau of Reclamation. Classified riparian vegetation communities using the system developed by Anderson and Omart (1984). Prepared technical memorandum to transmit the results of the field verification program to the Bureau.

Eagle River Flats, Alaska. Developed an ecological risk assessment for a wetland that had been used by the military as a munitions impact range. The wetland had substantial white phosphorous contamination that was determined to be the cause of significant waterfowl mortality. The assessment was derived from data presented in studies conducted by others. These data included information on environmental setting, problem formulation, conceptual site model, and bird studies (population and mortality surveys and telemetry studies). Reviewed and summarized existing reports to provide a quantitative estimate of ecological risk of the WP contamination.

Peabody Western Coal Company, Arizona. Evaluated the effects of surface coal mining on selenium and arsenic levels in soils, plants, and fish. Developed a method to compare onsite soil and overburden selenium and arsenic levels to other areas with similar geology in the Western U.S. Helped develop soil and plant sampling plan to address mining impacts. Summarized historic and recent soil and plant analytical data. Served as a liaison with client to coordinate other portions of the study (GIS data and graphics, surface and groundwater hydrology, human health, and livestock studies). Helped produce final technical report.

Truckee River Basin, California. Prepared portions of a technical report on the effects of land use activities on surface water quality in the Truckee River Watershed below Lake Tahoe in California. Coordinated data gathering with the client (Lahontan Regional Water Quality Control Board). Summarized existing data on significant land use activities by watershed units. Described the best management practices of various federal, state, and local agencies responsible for surface water quality in the project area.

American Petroleum Institute (API). Conducted literature review and drafted portions of a report on the uses of constructed and natural wetlands to treat effluent from petroleum-related industrial facilities. Summarized wetland treatment effects on reductions in organic and inorganic contaminants and effluent toxicity.

Williamson River Restoration Project, Oregon. Summarized data on chemicals applied to agricultural fields. Conducted literature review to determine potential ecological hazards posed by the chemicals to birds using surface waters in the project area.

Have participated in more than 25 different Energy and Siting and Licensing Projects, as follows:

Hidden Hills Solar Electric Generating System, San Inyo County, California. Provided senior review for AFC section that assessed potential impacts to soil resources for the proposed power plant project, which encompassed approximately 3,900 acres in Pahrump, California. Provided additional support for wind and water soil loss estimates. Also provided expert testimony support.

Ivanpah Solar Electric Generating System, San Bernardino County, California. Provided senior review for AFC section that assessed potential impacts to soil and agricultural resources for the proposed power plant project, which encompassed approximately 3,800 acres in the Mojave Desert region. Provided additional support for wind and water soil loss estimates used to estimate needs for construction water use and maintenance of detention pond facilities.

Chula Vista Energy Upgrade Project, MMC Energy, San Diego County, California. Prepared CEQA-equivalent documentation to support an Application for Certification (AFC) for review by the California Energy Commission. Prepared AFC section that assessed potential impacts to soil and agricultural resources for the proposed power plant projects This documentation included a summary of applicable laws, ordinances, and regulations (LORS), estimates of soil losses from wind and water erosion during construction, and agencies contacts.

Humboldt Bay Replacement Project, PG&E. Planned and executed the Phase II ESA using staff from a minority owned 'mentor-protégé' firm. Prepared the Phase II ESA cost proposal and work plan. Coordinated the field sampling activities and prepared the report. Met with client and regulator from the North Coast Regional Water Quality Board, where we garnered approval for our final recommended site investigation tasks to complete the Phase II ESA. Provided senior review for AFC section that assessed potential impacts to soil and agricultural resources for the proposed power plant project.

South Bay Replacement Project, LS Power. Prepared CEQA-equivalent documentation to support an Application for Certifications (AFC) for review by the California Energy Commission. Prepared AFC section that assessed potential impacts to soil and agricultural resources for the proposed power plant projects including all linear features (transmission lines, water supply and discharge lines, and natural gas supply lines). Also prepared section for waste management that described demolition, construction, and operation waste streams. This documentation included summaries of applicable laws, ordinances, and regulations (LORS) and agencies contacts. It also included estimates of soil losses from wind and water erosion during construction and mitigation and management strategies.

Eastshore Energy Center, Tierra. Prepared CEQA-equivalent documentation to support an Application for Certifications (AFC) for review by the California Energy Commission. Prepared AFC section that assessed potential impacts to soil and agricultural resources for the proposed power plant projects including all linear features (transmission lines, water supply and discharge lines, and natural gas supply lines). This documentation also included a summary of applicable laws, ordinances, and regulations (LORS), estimates of soil losses from water erosion during construction, and agencies contacts.

Application for Certification, Los Esteros Critical Energy Facility, Calpine C*Power, San Jose, California. Prepared Biological Resources Mitigation and Monitoring Plan (BRMIMP) for the Los Esteros Critical Energy Facility. Also documented the extent of jurisdictional waters of the U.S. at a stormwater outfall along Coyote Creek. Prepared a Low Effect Habitat Conservation Plan for the Phase II Facility. This plan was submitted for Section 10 consultation with the U.S. Fish and Wildlife Service to secure an incident take permit for Bay Checkerspot butterfly and to offset potential impacts to four endemic serpentine plants under the Endangered Species.

Application for Certification, East Altamont Energy Center, Calpine Corp., Tracy, California. Prepared CEQA-equivalent documentation to support an Application for Certifications (AFC) for review by the

California Energy Commission. Prepared AFC section that assessed potential impacts to soil and agricultural resources for the proposed power plant projects including all linear features (transmission lines, water supply and discharge lines, and natural gas supply lines). This documentation also included a summary of applicable laws, ordinances, and regulations (LORS), estimates of soil losses from wind and water erosion during construction, and agencies contacts. Additionally, conducted field investigations to assess wetlands in proximity to linear routes for the East Altamont Energy Center.

AFC for San Joaquin Valley Energy Center, Calpine Corp., City of San Joaquin, California. Prepared CEQA-equivalent documentation to support an Application for Certifications (AFC) for review by the California Energy Commission. Prepared AFC section that assessed potential impacts to soil and agricultural resources for the proposed power plant projects including all linear features (transmission lines, water supply and discharge lines, and natural gas supply lines). This documentation also included a summary of applicable laws, ordinances, and regulations (LORS), estimates of soil losses from water erosion during construction, and agencies contacts.

AFCs for Walnut Creek Energy Park and Sun Valley Energy Project, Edison Mission Energy, City of Industry/Romoland, California. Provided support for two Applications for Certification before the California Energy Commission for similarly designed 500-MW natural gas-fired peaking power plants using the GE LMS100 advanced gas turbine technology. These applications were prepared in parallel and were filed at the Energy Commission within one week of one another. The AFCs were filed in December of 2005 and the projects are scheduled to begin construction in 2007.

AFC for Roseville Energy Park, Roseville Electric, Roseville, California. Provided support for Application for Certification before the California Energy Commission for a 160-MW natural gas-fired power plant in Roseville, California.

AFC for AES Highgrove Project. Prepared CEQA-equivalent documentation to support an Application for Certifications (AFC) for review by the California Energy Commission. Prepared AFC section that assessed potential impacts to soil and agricultural resources for the proposed power plant projects including all linear features (transmission lines, water supply and discharge lines, and natural gas supply lines). This documentation also included a summary of applicable laws, ordinances, and regulations (LORS), estimates of soil losses from wind and water erosion during construction, and agencies contacts.

AFC for Walnut Energy Center, Turlock Irrigation District. Prepared CEQA-equivalent documentation to support an AFC for review by the California Energy Commission. Prepared AFC section that assessed potential impacts to soil and agricultural resources for the proposed power plant projects including all linear features (transmission lines, water supply and discharge lines, and natural gas supply lines). This documentation also included a summary of applicable laws, ordinances, and regulations (LORS), estimates of soil losses from wind and water erosion during construction, and agencies contacts. Prepared Response to Comments from the CEC.

PG&E Northeast San Jose Transmission Reinforcement Project, San Jose, California. Provided consulting and permitting services to PG&E for wetland and endangered species issues associated with a proposed 8.5-mile overhead electrical transmission line. Reviewed existing wetland and biological data for a range of alternative transmission tower alignments. Conducted fieldwork and prepared an additional wetland report to address previously un-mapped wetland feature. Prepared Biological Assessment report to assess potential impacts endangered species. Recommended a proactive plan to use construction and operation mitigation measures to avoid potential ESA impacts and preclude need for Section 10 consultation that would have delayed project.

Cosumnes Power Plant Project, Sacramento County, California. Completed delineation report for proposed power plant and 26-mile natural gas supply pipeline that was accepted by USACE using

GIS-based mapping. Produced Individual Permit Application for the project including application for Section 401 Water Quality Certification. Assessed wetland characteristics for pipeline through urban and rural areas along the pipeline route to support the USACE determination of jurisdictional wetlands.

Loren D. Bloomberg, PE

North American Director of Traffic Engineering and Traffic Simulation

Education

M.E., Civil Engineering, University of California, Berkeley, 1994
M.S., Civil Engineering, University of California, Berkeley, 1993
B.S., Systems Engineering, University of Virginia, 1989

Professional Registrations

Professional Engineer: California, 2000 (No. 2060)

Distinguishing Qualifications

- More than 20 years of experience, including transportation modeling and analysis for local areas, corridors, and entire regions
- Experienced in practical and theoretical applications of traffic operations and Intelligent Transportation Systems (ITS), particularly for freeways, arterials, toll facilities, and ramp metering
- Broad background in transportation planning, conceptual design, and multimodal transportation systems analysis
- Expert in traffic simulation modeling

Relevant Experience

Mr. Bloomberg is a Principal Technologist and CH2M HILL's North America Director of Traffic Engineering and Traffic Simulation. He is based in Santa Ana, California. With more than 20 years of experience, he has led or played a key role in numerous large-scale planning and operations analyses. He has conducted studies and developed plans for local areas, corridors, and entire regions including roadways, maritime facilities, and airports. Mr. Bloomberg's technical expertise is in traffic engineering and operations, with a particular focus on conceptual engineering and traffic modeling. He has worked on projects in 28 states, as well as internationally in New Zealand, Saudi Arabia, Abu Dhabi, Iraq, Dubai, Mexico, and Canada.

Mr. Bloomberg is often called on as a technical expert for CH2M HILL's traffic engineering and planning projects and as a project manager for his ability to complete traffic analyses accurately and efficiently while meeting client requirements. He is well-versed in environmental requirements for traffic analysis, and he is also an expert in the application of Context Sensitive Solutions (CSS), with successful project applications on a wide range of feasibility studies and preliminary engineering. He has taught CSS to more than 400 agency staff across the United States. He plays an active role in Transportation Research Board (TRB) committees: Managed Lanes (AHB35), Highway Capacity and Quality of Service Committee (AHB40), and the Simulation Task Force (AHB80T).

R **Transportation Analysis Lead; SR-710 North Alternative Analysis EIR/EIS; Los Angeles County Metro Transportation Authority; Los Angeles, California; 2011 to Present.** CH2M HILL is conducting alternatives analyses, preliminary engineering, and environmental studies for improvements centered on the State Route 710 (SR 710) freeway. The study area is bordered by SR 2, I-10, I-210, and I-605. A multimodal transportation system is under evaluation, with a focus on a freeway tunnel, light rail (tunnel and elevated) and Bus Rapid Transit (BRT). Mr. Bloomberg is leading the transportation analysis including supporting the purpose and need, evaluation approach for vehicles/transit/bicycle/pedestrian/parking, and alternatives evaluation. Evaluation tools include the SCAG and Metro regional travel models and simulation and operations tools. He is providing verbal and

written technical summaries of technical information to the Technical Advisory Committee, stakeholder groups, and Metro/Caltrans and leading the cost-benefit analysis using the Cal-B/C tool.

Project Manager; Managed Lanes Network Study for Orange County; California Department of Transportation (Caltrans) District 12; Orange County, California; 2014 to 2016. Project manager and technical lead for a regional planning study to address priced managed lane opportunities and challenges in Orange County.CH2M developed a logical, clear, and well-supported plan for the entire managed lanes network (priced or not priced), that will guide project development on the freeway corridors throughout the County. Key tasks included developing and applying a planning-level toll demand and revenue modeling (using CH2M HILL's DTRAM-ML model), and development of a County-wide Concepts of Operations (ConOps) for managed lanes. Technical studies included traffic operations analysis, interoperability and feasibility analysis, and a greenhouse gas evaluation. The deliverables included an implementation plan and final report. Throughout the project, extensive stakeholder and public outreach was conducted.

Traffic Lead, US 400 Passing Lane Traffic Study; Cherokee/Crawford/Labette/Greenwood/Butler Counties, Kansas; 2015. Overall traffic lead on a study to evaluate new passing lanes on the US Route 400 (US 400) corridor in southeastern Kansas. US 400 serves local, regional, and interstate travel and is a primary rural highway; the study area covers 133 miles. The technical evaluation included passing lane analysis, using the *Highway Capacity Manual* methodologies, and a comprehensive safety evaluation, plus a cost-benefit assessment. Lead architect of the overall technical strategy, and guided data collection, future traffic demand, operations analysis, and technical evaluation. Led the development of the technical documentation for the traffic analysis.

Project Manager; Transportation Services; Port of Long Beach; Long Beach, California; 2006 to Present. Directing CH2M HILL's work on this longstanding on-call contract to provide transportation planning and traffic engineering services for the Port of Long Beach. Task orders have included the following:

- Traffic studies to support environmental documents (CEQA/NEPA), including Middle Harbor, Pier S, and Edison Avenue. The analysis has focused on forecasting, impact analysis (vehicular and train traffic), assessment of heavy vehicles (truck percentages are as high as 50 percent), and developing mitigation.
- Technical support for the Port and their inside/outside counsel for litigation against the Middle Harbor EIR.
- Detailed research and the preparation of a draft RFP for ITS systems integrator services
- Evaluation of multimodal performance measures for application in the Port and City of Long Beach.
- Statistical evaluation of Port traffic data, analyzing correlation between roadway traffic counts and terminal activity, assessing demand elasticity, and evaluating hourly and daily variation on I-710.

Traffic Lead, Commerce/Buena Vista One-Way Couplet Conversion Traffic Study; San Antonio, TX; 2014 to 2015. Traffic lead and senior advisor on a project to review potential improvements to the Commerce Street/Buena Vista Street one-way couplet, west of downtown San Antonio. The study focused on traffic operations, safety, and cost impacts of converting the one-way couplet to two-way operations. Developed the analysis approach, and guided the evaluation of traffic, safety, and cost assessments. Led the technical report development, and coordinated activities between disciplines. Presented the findings to the City Councilmember who initiated the study, and worked with City staff to reach a decision on a preferred approach.

Technical Advisor; Moody/Porter Intersection Evaluation; Portland, Oregon; 2015. Traffic operations lead for a Subject Matter Expert (SME) review of a newly reconstructed intersection where vehicular

traffic, bus, and light rail interact with high volumes of pedestrians and bicycles. The intersection is adjacent to the new Tillikum Crossing Bridge, which will exclusively serve non-motorized vehicle users including pedestrians, bicycles and transit modes. The focus was to evaluate operations and safety from the perspective of each type of user (pedestrian, bicyclist, rail rider/operator, bus rider/ operator) beginning from each entrance point. The team conducted a detailed field review, and assessed project concept plans focused on each mode. The analysis also focused on interactions with the adjacent street network, and adjacent development and land uses. Recommendations were made to enhance safety, operations, and provide clearer direction to users.

Traffic Lead; Franchise Implementation Plan Traffic Analysis; City of Los Angeles; 2012 to 2014. Lead traffic engineer on a comprehensive Environmental Impact Report (EIR) for the City of Los Angeles Franchise Implementation Plan. As part of the environmental process, the CH2M HILL team conducted a detailed traffic operations analysis of the potential traffic impacts related to the adoption of the proposed ordinance. The traffic analysis included estimates of truck travel for trips by private collection firms (haulers) to transport municipal solid waste (including commingled recyclables and organic waste) from multi-family and commercial customer locations to waste disposal and processing facilities. A comprehensive new analytical technique was developed to estimate truck travel in vehicle miles of travel (VMT) and vehicle hours of travel (VHT) for each alternative. Provide technical guidance on a new methodology to estimate VMT and VHT through a complex series of calculations. A customized data collection program was implemented, including phone interviews with haulers and field surveys where trucks were followed and recorded using GPS technology.

Transportation Analysis Lead; Ras Tanura Master Planning Update; Kingdom Of Saudi Arabia; 2012 to 2013. Transportation analysis lead and technical advisor on this effort to update a 1998 master plan for the Ras Tanura community, which includes a gated community for refinery workers and the larger community of Ras Tanura. The wider planning area included a broad highway network in northeastern Saudi Arabia, north of Dammam up to near the Kuwait border. The transportation analysis included an assessment of roadway functional class, planning for a transit network, development of parking strategy and an access management plan, and long-range planning and prioritization of projects. The focus of the analysis was an implementation plan, to identify the location, size, and type of highway improvements. Traffic analysis included VISUM (forecast modeling), VISSIM, Synchro, and HCS.

Transportation Analysis Lead; Hassyan Clean Coal Power Station Environmental Impact Assessment (EIA); Emirate Of Dubai; 2014. Transportation analysis lead and technical advisor on this project to assess a new conventional hard coal power station located in the southern end of the Emirate of Dubai, adjacent to the Dubai – Abu Dhabi municipality border. The evaluation considered the increase in transport infrastructure use (ports/roads) and traffic is expected due to equipment, materials, product, and workforce movement during construction and operation of the project. Terreestial and marine impacts were evaluated.

Task Lead; Huntington Beach Energy Center Project; Huntington Beach, California; 2012 to 2014. Traffic lead for the application for certification (AFC) for a new 939-megawatt (MW) combined-cycle power plant. Led the analysis to evaluate the construction and permanent potential effects of the new facility, which is located in a beach community, directly adjacent to a popular beach. Assessed traffic operations impacts, transport of hazardous materials and public safety to support the owner's successful efforts to secure licensing of the new facility.

Traffic Lead; Demolition and Environmental Cleanup Activities at Santa Susana Field Laboratory EIS; Ventura County, California; 2013 to 2014. Technical lead on the transportation evaluation of potential environmental impacts from its Proposed Action to conduct demolition activity and remediation of groundwater and soil on the NASA-administered property at Santa Susana Field Laboratory (SSFL).

Developed the approach and application of impact analysis for roadway operations and LOS; potential exposure of school children to truck traffic; and potential safety effects from the project-related truck trips, pavement conditions, and parking. The local (Woolsey Canyon Road, Roscoe Boulevard, and Topanga Canyon Road); and regional network (I-405, I-5, I-210, and SR 14) were evaluated. The primary impact evaluation focused on truck traffic along the routes accessing SSFL and from onsite demolition, construction, and environmental cleanup activity.

Traffic Lead; Dow Chemical Company Modernization Project Initial Study; Pittsburg, California; 2013 to 2014. Traffic lead to prepare an Initial Study (IS) on a proposed project to expand and modify Dow's Pittsburg Operations Facility. The project is an upgrade to three existing plants and construction of a new plant. Transportation analysis focused on the traffic generated by the proposed Project, considering the anticipated construction schedule, activities, and workforce. Impact analysis included the freeway (SR 4) and interchanges, along with the local street system near the plants. Mitigation strategies, including a TMP, were developed.

Task Lead; Fairway Drive Grade Separation; Alameda Corridor East; Industry, California; 2011 to 2013. Overall task lead on this project to provide design, engineering and bidding, and construction support services for a railroad grade separation (roadway underpass). The project is located at the intersection of Fairway Drive and the Union Pacific (UPRR) railroad lines (Los Angeles Subdivision) in the City of Industry. Developed the TMP and traffic design plans for 35 percent, 65 percent, 85 percent, 100 percent, and final plans, specifications, and estimates (PS&E) bid documents for the assigned project.

Traffic Analysis Lead; Hidden Hills Solar Electric Generating System; BrightSource Energy; Inyo County, California, 2011 to 2013. Traffic and transportation task lead for analysis of a solar energy project in the Mojave Desert, near the California/Nevada border. Prepared the traffic and transportation analysis section of the Application for Certification. The analysis focused on construction impacts to traffic operations, including construction workers, truck trips, and transport of hazardous materials. Assessed intersection and highway impacts of a complex worker schedule, and developed a comprehensive mitigation strategy. Testified on behalf of the owner in front of the California Energy Commission.

Senior Advisor; Valley View Grade Separation Traffic Analysis; Caltrans District 7; Los Angeles, California; 2011. Technical lead for a task order, providing guidance on the traffic analysis to support the approval of a California Public Utility Crossing (PUC) application for the proposed at-grade railroad crossing associated with the Valley View Avenue grade separation improvements near I-5. The traffic analysis included intersection LOS analysis, traffic queuing calculations, and signal warrants.

Traffic Analysis Lead; Pahnamid Wind Farm; Kern County, California; 2011. Lead for traffic analysis of a proposed wind energy facility that would include up to 137 wind turbine generators capable of generating up to 411 megawatts of power. The analysis included an assessment of existing traffic conditions, evaluation of proposed construction and operations traffic, and an analysis of expected impacts and associated mitigation.

Technical Advisor; Yanbu Refinery Expansion Project; Yanbu Industrial City, Saudi Arabia; 2011. Guided traffic analysis on this effort to expand the lube oil production of the existing Lubricating Oil Refining (LUBEREF) facility in Yanbu Industrial City, in the Kingdom of Saudi Arabia. Lead traffic analysis for the environmental evaluation, including evaluation of a traffic survey, assessment of baseline conditions, and analysis of project impacts during and after construction of the proposed facility.

Traffic Lead; Sampson Way Improvements; Port of Los Angeles; San Pedro, California; 2010 to Present. Traffic lead and advisor for consensus-building on this effort to develop plans for improvements to Sampson Way. These improvements will be in concert with changes to the San Pedro Waterfront and an emphasis on connecting the waterfront areas with downtown San Pedro. Activities have included

stakeholder meetings, development of improvement concepts, traffic analysis evaluation, and multimodal planning. Focus issues have been on Harbor Boulevard closures and pedestrian access from the bluffs areas to Ports O' Call Village.

Traffic Lead; Shell Pond Restoration Phase 1A; Pacific Gas and Electric Company; Bay Point, California; 2010 to 2011. Remediation of the PG&E Shell Pond and Carbon Black Area property will require months of trucking activity associated with ground remediation and material hauling. The Phase 1A work involves the construction of a temporary gravel access road and bridge, which requires significant hauling of aggregate material to the site over approximately 9 weeks. CH2M HILL prepared a Transportation Management Plan (TMP) to manage transportation issues associated with the construction of the temporary access road and bridge. This addressed transport methods and modes, features that are unique to the truck route and property, traffic control and management measures, and the parties that will be responsible for execution of the TMP. Led all TMP activities, including reconnaissance with the contractor and coordination with affected agencies.

Traffic Lead; 4th Street Station; Washoe County RTC; Reno, Nevada; 2010. Directed the operations planning for the new 4th Street Station downtown transit center in Reno. The focus of the analysis was on the effects of a pulsed release system for transit vehicles. To accommodate the high volume of buses, the signal timing changes were developed to improve transit operations without impacts to existing local traffic. Analysis included detailed transit and traffic operations assessments using a VISSIM model, with both opening day and future year traffic conditions.

Professional Organizations/Affiliations

- Transportation Research Board (TRB)
  - Member, Highway Capacity and Quality of Service Committee (AHB40)
  - Chair, Uninterrupted Flow Group
  - Past Chair, Traffic Simulation Applications subcommittee
  - Chair, Computational Engines Task Force
  - Member, Joint Traffic Simulation Subcommittee AHB45(1)
  - Managed Lanes Committee AHB35
  - Simulation Task Force AHB80T
- Institute for Transportation Engineers
- WTS

Publications and Presentations

Current and Future Technology Trends: Managed Lanes and Connected/Autonomous Vehicles". Invited speaker – PSKLM International Expressway Conference and Exhibition; Kuala Lumpur, Malaysia, May 2015.

"Transportation Trends in California: Managed Freeway Lanes". Lecture to the Institution of Engineers Malaysia; Kuala Lumpur, Malaysia, July 2014.

"Planning for Managed Lanes in San Diego". ITE San Diego Section. June, 2014.

"Preserving the Lost Art of Geometric Design: Tools, Techniques, and Talent – Highway Capacity and Quality of Service". Transportation Research Board Annual Meeting; Washington DC, January 2014.

"A Preliminary Assessment of the 2010 HCM Weaving Methodology." Presented at the 6th International Symposium on Highway Capacity and Quality of Service; Stockholm, Sweden, June 2011.

"Applying Context Sensitive Solutions." Presented at the Northern Nevada Transportation Collaborative Sustainability Summit, Reno, NV, December 2010.

"The Role of Simulation in the 2010 Highway Capacity Manual." Presented at the 2010 ITE Western District Annual Meeting; San Francisco, CA, June 2010.

"O-D Inputs from Travel Demand Models: Translating to the 'Real World' of Traffic Simulation" with Jennifer Emerson. Presented at the Integrated Corridor Systems Management Modeling Best Practices Workshop; Irvine, CA, September 2009.

"The Role of Simulation in the 2010 Highway Capacity Manual." Presented at the 2009 ITE Western District Annual Meeting; Denver, CO, July 2009.

"An Integrated Demand Estimation and Traffic Operations Analysis Approach for Managed Lanes Facilities" with John El Khoury. Presented at the 88th Annual Meeting of the Transportation Research Board, Washington, D.C., January 2009.

"Highway Capacity and Quality of Service (HCQS) Committee Perspectives on the Role of Simulation in the 2010 Highway Capacity Manual." Presented at the 88th Annual Meeting of the Transportation Research Board, Washington, D.C., January 2009.

"HCM2010 – What's Coming: Weaving Areas". Presented at the Annual Meeting of the Institute of Transportation Engineers. Anaheim, California. August 2008.

"Development of Best Practices for Traffic Impact Studies" with Darren Muldoon. Transportation Research Record 2077. Presented at the 87th Annual Meeting of the Transportation Research Board, Washington, D.C., January 2008.

"Simulation Approach for Analyzing Managed Lanes Operations on SR 52 in San Diego" with John El Khoury. Presented at the 87th Annual Meeting of the Transportation Research Board, Washington, D.C., January 2008.

"The Art of Traffic Simulation (and Efforts to Turn It Into a Science)" with Erik Ruehr. Presented at the 2007 ITE District 6 Annual Meeting, Portland, Oregon, July 2007.

"'Long Enough': The Relationship Between Ramp Merge Length and Performance Per the HCM and Simulation." Presented at the 5th International Symposium on Highway Capacity and Quality of Service, Yokohama, Japan, July 2006.

"58 Things the HCM [Highway Capacity Manual] Can't Do." Invited presentation by the Highway Capacity and Quality of Service Committee. Presented at the 85th Annual Meeting of the Transportation Research Board, Washington, D.C., January 2006.

"Planning Urban Highway Reconstruction with Traffic Demand Affected by Construction Schedule" with Eul-Bum Lee and David Thomas, Journal of Transportation Engineering, October 2005.

"Comparison of Simulation Models and the HCM" with Mike Swenson and Bruce Haldors. Presented at the 82nd Annual Meeting of the Transportation Research Board, Washington, D.C. January 2003.

"An Innovative Approach for Linking TransCAD and CORSIM via Synchro" with Christine Warren and Ed Granzow. Presented at the ITE District 6 Annual Meeting, Palm Desert, California. July 2002.

"Calibrating the INTEGRATION Model." Presented at the HCQS Conference on Simulation Models and Quality of Service, Truckee, California. July 2001.

"Calibrating Simulation Models: Seeing Both the Forest and the Trees." Presented at the ITE District 6 Annual Meeting, Albuquerque, New Mexico. July 2001.

"Freeway Systems Research Beyond the HCM2000" with Adolf May, Nagui Rouphail, Fred Hall, and Tom Urbanik. Presented at the 80th Annual Meeting of the Transportation Research Board, Washington, D.C. January 2001. Accepted for Publication in the Transportation Research Record.

"A Comparison of the VISSIM and CORSIM Traffic Simulation Models" with Jim Dale. Presented at the Annual Meeting of the Institute of Transportation Engineers, Nashville, Tennessee. August 2000.

"A Comparison of the VISSIM and CORSIM Traffic Simulation Models on a Congested Network" with Jim Dale. Presented at the 79th Annual Meeting of the Transportation Research Board, Washington, D.C. January 2000. Accepted for Publication in the Transportation Research Record.

"Validation Results for Four Models of Oversaturated Freeway Facilities" with Fred Hall, Nagui Rouphail, Brian Eads, and Adolf May. Accepted for the 79th Annual Meeting of the Transportation Research Board, Washington, D.C. January 2000.

"Application of the INTEGRATION Model of the Salt Lake Metropolitan Area" with Tony Young and Hesham Rakha. Prepared for the ITE District 6 Annual Meeting, San Jose, California. July 1998.

"Capacity and Level of Service Analysis of Freeway Systems" with Dolf May, Stephen Cohen, Brian Eads, Fred Hall, Ajay Rathi, Nagui Rouphail, and Tom Urbanik. Prepared for the Third Internal Symposium on Highway Capacity, Copenhagen, Denmark. June 1998.

"Micro Simulation of a Large-Scale Network: The Salt Lake City Case Study" with Hesham Rakha, Michel Van Aerde, and X. Peter Huang. Transportation Research Record 1644. Originally prepared for the 77th Annual Meeting of the Transportation Research Board, Washington, D.C. January 1998.

"INTEGRATION Modeling of the Salt Lake Metropolitan Area" with X. Peter Huang and Ryan Christenson. Prepared for the ITE District 6 Annual Meeting, Salt Lake City, Utah. July 1997.

"The Institutional Challenges of Developing a Management Strategy for the San Francisco Bay Area: The Implications of ITS Planning and Deployment" with William R. Loudon. Prepared for the 7th Annual Meeting of ITS America, Washington, D.C. January 1997.

"Development and Application of the Portland Traffic System Performance Evaluation (TSPE) System" with Jamie Throckmorton and Terry Klim. Transportation Research Record 1603. Originally prepared for 76th Annual Meeting of the Transportation Research Board, Washington, D.C. January 1997.

"The Challenges of Developing an Interjurisdictional, Multimodal Transportation Management Strategy for the San Francisco Bay Area" with William R. Loudon. Prepared for 76th Annual Meeting of the Transportation Research Board, Washington, D.C. January 1997.

"Simulation Modeling of the Santa Monica Freeway" with Adolf D. May. Institute for Transportation Studies working paper, Berkeley, California. 1994.

"Freeway Simulation with the INTEGRATION Model" with Yonnel Gardes, Adolf D. May, and Michel Van Aerde. Prepared for the ITE District 6 Annual Meeting, 1993 Compendium of Technical Papers.

"Freeway Detector Data Analysis for Simulation of the Santa Monica Freeway" (Initial Investigations and Summary Report) with Adolf D. May. Institute for Transportation Studies working papers, Berkeley, California. 1993.

Thomas Priestley, Ph.D., AICP/ASL

Visual Resources Specialist, Senior Environmental Planner

Education

Ph.D., Environmental Planning, Department of Landscape Architecture, UC Berkeley, 1988
M.C.P., City Planning, Department of City and Regional Planning, UC Berkeley, 1976
M.L.A., Environmental Planning, Department of Landscape Architecture, UC Berkeley, 1974 B.U.P., Urban Planning, Department of Urban and Regional Planning, University of Illinois, 1969

Professional Registrations

- American Institute of Certified Planners (Certified Planner No. 008919)
- American Planning Association
- American Society of Landscape Architects

Distinguishing Qualifications

- Over 30 years of professional experience as a professional urban/environmental planner, university professor, and researcher
- Visual assessment specialist with involvement in over 100 visual assessment efforts
- Skilled in scoping aesthetic and urban design issues and in developing and implementing the appropriate analyses
- Experienced in the preparation of analyses that meet the requirements of the National Environmental Policy Act (NEPA), California Environmental Quality Act (CEQA), Federal Highway Administration (FHWA), Bureau of Land Management (BLM), and U.S. Forest Service (USFS)
- Broad knowledge of methods used for siting electric generation, transmission, and substation facilities and mitigating their land use and aesthetic effects
- Has conducted widely cited research on the perceptions and property value impacts of electric transmission lines and has consulted on electric facility property value issues

Relevant Experience

Dr. Priestley has more than 30 years of professional experience in urban and environmental planning and visual resource assessment. He is known nationwide for his expertise in evaluating aesthetic, land use, property value, and public acceptance issues related to electric energy projects. His experience includes projecting community land use development trends to determine facility needs and optimal location; assessing land use and visual effects of proposed infrastructure facilities; conducting studies of public perceptions of project visual effects; evaluating the property value effects of electric transmission lines; and evaluating the shadow flicker effects of wind power projects. Through his project experience and research conducted for utility clients, Dr. Priestley has developed expertise in methods used for siting electric generation, transmission, and substation facilities and mitigating their land use, aesthetic, and other environmental effects. As editor or co-author, he has made major contributions to Edison Electric Institute (EEI) publications related to understanding and evaluating the environmental effects of electric facilities.

Representative Projects and Dates of Involvement

Task Lead and Expert Witness; Various Clients; Visual Resource Impact Analyses of Gas-fired Power Plants, Various Locations, California. Evaluated potential visual resources impacts of more than 20 gas-fired power plants proposed for a variety of urban and rural settings in California. Identified visual

issues, designed the analysis strategies, contributed to development of architectural and landscape treatments, prepared visual resources analyses for the AFCs for submittal to the CEC, reviewed and critiqued relevant sections of the Energy Commission's analyses of the projects, and evaluated the visual issues associated with CEC-proposed alternative sites. As an expert witness on visual resources, prepared written testimony and provided oral testimony in hearings before the CEC.

Task Lead; Calpine; Power Plant Fatal Flaw Analyses; Various California Locations. Conducted initial scoping of visual issues of candidates sites for the development of combined cycle power plants. Identified visual resource constraints on the use of the sites for a power plant and recommended siting and design measures to reduce visual impacts.

Task Lead and Expert Witness; Mid American Energy; Salton Sea Geothermal Unit 6; Imperial County, California. Assisted with the licensing of a 185-MW geothermal power plant, associated steam wells, and 31 miles of transmission line proposed for a site adjacent to the Salton Sea and the Sonny Bono Salton Sea National Wildlife Refuge. Conducted supplemental aesthetic analyses to respond to requests for additional information by the CEC, reviewed and critiqued the CEC Preliminary and Final Staff Assessments, and provided testimony at project workshops.

Senior Consultant and Expert Witness; Solar Reserve; Rice Solar Energy Project; Riverside County, California. Senior reviewer for the Application for Certification (AFC) visual resource analysis prepared by CH2M HILL's visual resources staff for a solar thermal project proposed by for development on 3,325 acres of privately owned land on the site of the former Rice Army Airfield in the Mojave Desert region of eastern Riverside County. Provided expert testimony before the California Energy Commission (CEC), leading to a determination by the CEC that the aesthetic impacts of the project would be less than significant.

Senior Consultant and Expert Witness; Bright Source Energy; Ivanpah Solar Electric Generating System; San Bernardino County, California. Senior reviewer for the AFC visual resource analysis prepared for a solar thermal project proposed by for development on 3,400 acres of federal land managed by BLM that are located in the desert region of eastern San Bernardino County, approximately 5 miles southwest of Primm, Nevada. Prepared detailed studies of impacts of project on views from nearby Wilderness and National Monument lands and provided expert witness testimony on the visual resources issues before the CEC.

Task Lead; Southern California Edison (SCE); Tehachapi Renewables Transmission Project; Southern California. Technical lead for the analysis the visual impacts of a proposed 190-mile, 500-kV transmission line. The route traversed a diverse and complex set of landscapes that include open lands in the Antelope Valley, National Forest lands in the San Gabriel Mountains valued for their recreational and scenic importance, and highly developed urban areas in the San Gabriel Valley. Designed the analysis strategy that was implemented by a team of five CH2M HILL visual resource specialists, who were supported by CH2M HILL planners and GIS, visual simulation, graphics, and report production staff.

Task Lead; Dominion Energy; Visual Impact of Cooling Tower Alternatives for the Manchester Street Generating Station; Providence, Rhode Island. Evaluated the visual impacts of alternative cooling tower options considered for a large combined cycle gas-fired power plant located at a visually prominent site on the Providence waterfront. Scoped the issues, directed the preparation of analytic maps, identified and photo documented critical viewpoints, and directed the production of visual simulations depicting the three alternative cooling tower structures and the steam plumes associated with them. Evaluated the visual impacts of the alternatives on the critical viewpoints, and prepared a report documenting the analysis for submission to the Rhode Island Department of Environmental Management.

Matthew M. Franck

Environmental Planner

Education

BS, Environmental Policy Analysis and Planning, University of California at Davis, 1989

Distinguishing Qualifications

- Experienced in preparing environmental documents to fulfill California Environmental Quality Act (CEQA), National Environmental Policy Act (NEPA), and other resource agency requirements
- Specialized experience in permitting and application leadership activities with various municipal, state, and federal entities
- Specialist in applying environmental regulations to water infrastructure and water resources projects
- Expertise in the comprehensive analysis of project impacts to surface water hydrology, groundwater, water supply, wastewater treatment, and drainage and stormwater quality

Relevant Experience

Environmental planner with CH2M HILL with 26 years of experience managing and writing environmental impact assessment documents that comply compliance with NEPA and CEQA. Coordinates local, state, and federal regulatory processes. Combined education, multidisciplinary experience, and land use and resource planning expertise provide a solid background for evaluating complex environmental policy issues.

Representative Projects and Dates of Involvement

Water Resources and Water Infrastructure

Permit Manager, Davis-Woodland Water Supply Project, Woodland, CA. Managed the processes to obtain over two dozen construction-related permits for the Davis-Woodland Water Supply Project, which received its permit to operate in 2016. The project consists of a new 30 mgd regional water treatment facility and over 14 miles of raw and treated water transmission pipelines. The project is being delivered under a Design-Build-Operate delivery model. Several key approvals were obtained prior to turning the project over to CH2M HILL as the DBO contractor. Has led the effort to obtain all of the remaining permits. Key permits include SWRCB Drinking Water Permit, RWQCB Waste Discharge to Land, Caltrans "Double" Encroachment Permit, Air District Authority to Construct/Permit to Operate, Construction Dewatering Permits, CDFW Streambed Alteration Agreement, and various local agency permits (e.g., encroachment and building permits). The effort also includes coordinating the implementation of EIR mitigation measures (approximately 60) with the final design and construction processes.

Water Resources Task Manager, Santa Susana Field Laboratory Remediation Environmental Impact Statement, National Aeronautical and Space Administration, Ventura County, CA. Prepared the Water Resources analysis associated with a range of soil and groundwater remediation technologies and demolition of facilities on the NASA-administered portion of the Santa Susana Field Laboratory, located between Simi Valley and the San Fernando Valley. Impacts were assessed for eight different soil remediation technologies including excavation and offsite disposal, soil vapor extraction, ex situ treatments, and in situ treatments. Impacts also were assessed for six different groundwater radiation technologies including pump-and-treat, vacuum extraction, and chemical oxidation.

Task Manager, CEQA Addendum for Diversion of Hill Canyon Wastewater Treatment Plant Discharges, City of Thousand Oaks, CA. Managed the effort to prepare a CEQA addendum related to downstream diversion of wastewater discharges from the Hill Canyon WWTP under Water Rights Decision 1638. D-1638 was based on an assumption that diversions would increase over time, therefore addressing concerns associated with converting a watercourse (Calleguas Creek) from ephemeral to permanent. The CEQA Addendum supported a petition for a time extension associated with the re-diversion of downstream flows, and demonstrated that the time extension would not result in new significant environmental impacts. The project included coordination with the SWRCB Division of Water Rights.

Task Manager, CEQA Initial Study and Mitigated Negative Declaration for Goldsworthy Desalter, Water Replenishment District of Southern California, Torrance, CA. Managed the effort to prepare a CEQA Initial Study and Mitigated Negative Declaration for the expansion of a desalter plant in urban Los Angeles County. The project included five alternative well sites to supply water to the expanded facility, with pipeline construction of over 0.5 mile each. Support included preparing the Notice of Intent, Notice of Completion, and Notice of Determination.

Project Manager, Wolfe Road Recycled Water Pipeline Initial Study/Mitigated Negative Declaration, City of Sunnyvale. Managed the preparation of a CEQA Initial Study for a 13,500-foot recycled water pipeline and pump station improvements in suburban Sunnyvale. The project makes recycled water available to new areas of Sunnyvale, including schools, parks, and the proposed Apple 2 campus in nearby Cupertino. Most construction would be open-trench along a four- to six-lane arterial roadway, with bore-and-jack construction under a regional railroad (Caltrain). The environmental impact analysis process focused on construction activities, with additional consideration of long-term effects of recycled water use.

Project Manager; Environmental Impact Assessment for Phase 1C Pipelines; South Bay Water Recycling Program; San Jose, CA. Managed preparation of 15 environmental impact assessment documents. Prepared 15 addenda to previously approved NEPA and CEQA environmental documents for new recycled water pipeline projects in San Jose, Santa Clara, and Milpitas. The project involved preparing project descriptions for 15 projects in various states of development; coordinating environmental review efforts, including detailed cultural resources evaluations (by subconsultant); and helping direct the environmental program as documents were separately processed through Reclamation, the State Historic Preservation Officer, and local processes. Resulting work included four additional addendum documents, and environmental review for 10 recycled water access points (wharf heads) and up to 40 private connections to the South Bay recycled water system. Construction of several of the projects was funded by the American Recovery and Reinvestment Act.

Task Manager (Environmental); Eastside Road Storage Project; Town of Windsor, CA. Managed the preparation of the Final Supplemental Environmental Impact Report (EIR) for a proposed offsite storage reservoir for recycled water. The site for the 215-million-gallon reservoir (Pond T) included a 28-acre forested hillside, with extensive planned excavation for an earthen dam as well as related project features (such as outlet works, pipelines, and access roads). The supplemental analysis required study of biological resources, hydrology and groundwater, visual resources, geology and soils, and paleontology, as well as traffic, air, and noise impacts. Project implementation was driven by the need for additional recycled water storage capacity to balance inflow (from the wastewater treatment system) with outflows for irrigation use.

Project Manager; Proponent's Environmental Assessment; Golden State Water Company; Sutter County, CA. Managed preparation of a Proponent's Environmental Assessment (PEA). The PEA document supported Golden State Water Company's application to the California Public Utilities Commission for a Certificate of Public Convenience and Necessity for a new water system to serve the

7,500-acre Sutter Pointe in south Sutter County. Prepared the comprehensive environmental impact document for the new water delivery system, including analysis of potential groundwater pumping and surface water diversion impacts. Supported Golden State Water Company through the Public Utilities Commission licensing process.

CEQA Task Manager; Environmental Support for Bickford Tank; Placer County Water Authority; Loomis Area, CA. As part of an integrated project delivery team, supported the design of Placer County Water Authority's (PCWA) new Bickford Ranch water tank by providing CEQA document and site assessment services. Repackaged the adopted Bickford Ranch EIR into a concise, focused Mitigated Negative Declaration that evaluated the impacts of the changed project in the context of the prior EIR. Prepared a Phase 1 Environmental Site Assessment that summarized the potential for contamination of the environment and worker health and safety. Findings from both studies were integrated with the overall design effort.

Environmental Support Team; Werner Tank; Placer County Water Agency; Ophir Area, CA. As part of an integrated project delivery team, supported the design of PCWA's new Werner Road water tank by providing CEQA and site assessment services. Prepared a Mitigated Negative Declaration to support the property acquisition phase, and a new CEQA document to address the impacts of the specific project. Prepared a Phase I Environmental Site Assessment to evaluate past contamination, and as a result prepared a Phase 2 study including soil sampling and laboratory analysis. Coordinated with the Department of Toxic Substances Control to resolve concerns associated with prior agricultural contamination. The overall design effort integrated findings from all studies.

Task Manager; Environmental Documentation and Permitting; OMI-Thames Water; Stockton, CA. Environmental documentation and permitting support Task Manager for the contract operation of the City of Stockton's wastewater, water, and stormwater infrastructure. Coordinated a contractor's preparation of an EIR under CEQA for the upgrade of the City's wastewater treatment plant in accordance with Clean Water Act requirements. Prepared an application to the U.S. Coast Guard for a new utility bridge crossing of the San Joaquin River, including a NEPA Environmental Assessment. Extensively coordinated with the National Marine Fisheries Service, U.S. Fish and Wildlife Service, California Department of Fish and Game, Central Valley Regional Water Quality Control Board, and state and local levee agencies.

Task Manager; North Delta Improvements Project; California Department of Water Resources; Sacramento, CA. Task Manager for the preparation of four resource evaluation sections for the North Delta Improvements Project EIR. The project involved a large combination of related actions near Walnut Grove, CA, to improve the passage of floodwaters through a "bottleneck" in the Sacramento San Joaquin Bay-Delta System. Project elements included significant levee alterations, channel dredging, and an assortment of landside actions such as restoration of McCormack-Williamson Tract. Manage preparation of the Water Quality, Water Supply, Power, and Public Health and Safety sections, and authored the Water Quality and Water Supply Sections. This work was conducted for Jones & Stokes, the Department of Water Resources (DWR) lead consultant.

Task Manager; South Delta Improvements Project; California Department of Water Resources and U.S. Bureau of Reclamation; Sacramento, CA. Task Manager for preparation of six resource evaluation sections for the South Delta Improvements Project Environmental Impact Statement (EIS)/EIR. The project involved: 1) increasing pumping from the State Water Project's Banks Pumping Plant and 2) Installing four operable barriers in various waterways in the Sacramento – San Joaquin Delta. The South Delta Improvement Project (SDIP) allowed additional water supply exports from the Delta while taking action (through operation of the barriers) to maintain and enhance water quality for agriculture use in the Southern Delta. Managed preparation of the Land and Water Use, Power Production and Energy,

Socioeconomic Impacts, Recreation, Transportation and Navigation, and Public Services and Utilities sections. Lead author for the Land and Water Use and Power Production and Energy sections. Assessed the delivery of additional tasks related to the environmental permits for installation of the operable barriers, including the effectiveness of the Head of the Old River barrier. This work was conducted for DWR's lead consultant, Jones & Stokes

Project Manager; Delta-Mendota Canal/California Aqueduct Intertie EIS; U.S. Bureau of Reclamation; Sacramento, CA. Project Manager for preparation of the EIS for the proposed Intertie project. This project enhanced the flexibility and reliability of the Central Valley Project and State Water Project by building a connecting pipeline between the Delta Mendota Canal and the California Aqueduct. This EIS was prepared as a result of litigation on a prior document, and included enhanced analysis of water supply and fisheries impacts to bolster its defensibility under NEPA. Water supply and related impacts (including fisheries) were quantitatively analyzed using the CALSIM 2 and DSM2 hydrodynamic models, which required extensive coordination with other statewide water resources programs, such as the Operations Criteria and Plan - and sensitivity to endangered species concerns (including Delta smelt habitat and mortality). Extensively coordinated with the Western Area Power Administration, because the Intertie process used electricity generated by federal water projects.

Task Manager; Sacramento Valley Water Management Program; Northern California Water Agency; Central Valley, CA. Task Manager for an EIS/EIR for the implementation of a Sacramento Valley-wide water management program. The purpose of the program was to meet water quality standards in the Sacramento-San Joaquin Bay-Delta by increasing water supply reliability in the Sacramento Valley, which required a coordinated effort among approximately 25 stakeholders (mostly local water districts). The project involved the application of CALSIM2, a mass-balance hydrologic model that evaluates the movement of water throughout the Central Valley, including the effects of the federal Central Valley Project and the State Water Project.

Task Leader; Arden Parallel Force Main; Sacramento Regional County Sanitation District; Sacramento, CA. Task Leader for the coordination of all environmental permit activities for the construction of a 60-inch sewer force main in Sacramento County, most of which was located within the environmentally sensitive American River Parkway. Coordinated with permitting agencies including the U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service, California Department of Fish and Game, Central Valley Regional Water Quality Control Board, State Lands Commission, and the State Reclamation Board. Managed staff in wetland delineation and special-status species surveys. Coordinated with the county's Department of Environmental Review and Assessment to ensure completion of CEQA documentation for the project.

Quality Assurance/Quality Control Lead (Environmental); Franks Tract Feasibility Study; U.S. Bureau of Reclamation; Sacramento, CA. Provided initial direction and senior review of planning studies conducted pursuant to the federal Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies. The project involved various physical and operational alternatives in the north/central Sacramento-San Joaquin Delta to improve water quality for Delta exports and Delta fish conditions. Completed studies for the Plan of Study, Initial Alternatives Information Report, and Plan Formulation Report.

Task Manager; Conveyance of Refuge Water Supply – Mendota Wildlife Area Environmental Assessment/Initial Study; U.S. Bureau of Reclamation; Mid-Pacific Region; CA. Managed the preparation of environmental documents under NEPA and CEQA. The project involves the construction of a new Mendota Dam downstream from the site of the existing dam. A new, modern Mendota Dam would reduce the need for dewatering the reservoir (Mendota Pool) to perform dam safety inspections, this ensuring the reliability of water deliveries from the Mendota Pool to the Mendota Wildlife Area. The

project includes the evaluation of the potential changes in riparian habitat associated with the footprint of the new dam in relationship to an existing Programmatic Biological Opinion.

Project Manager; Conveyance of Refuge Water Supply – East Bear Creek Unit Environmental Assessment; U.S. Bureau of Reclamation, Mid-Pacific Region; CA. Managed the preparation of environmental documents under NEPA and CEQA. The project involved the construction of new conveyance infrastructure to provide reliable water deliveries to the East Bear Creek Unit of the San Luis National Wildlife Refuge. The East Bear Creek Unit was established as part of the San Joaquin Basin Action Plan/Kesterson Mitigation Plan, and underwent habitat restoration from grazing land to productive wetland and associated upland habitat. Completion of the environmental documents and associated permits allowed for the delivery of reliable water supplies to sustain the restored habitat.

Task Manager; Conveyance of Refuge Water Supply – South San Joaquin Valley Environmental Assessment/Initial Study; U.S. Bureau of Reclamation; Mid-Pacific Region; CA. Managed the preparation of environmental documents under NEPA and CEQA. This project involved capacity improvements to existing agricultural water conveyance infrastructure to allow delivery of reliable water supplies to the Kern National Wildlife Refuge and the Pixley National Wildlife Refuge in the southern San Joaquin Valley. The key resource of concern was threatened and endangered species that are known to inhabit the unique alkali grassland habitat in the southern San Joaquin Valley, including the San Joaquin kit fox, several threatened reptiles, and many special-status plants.

Modifications to Folsom Dam; U.S. Army Corps of Engineers; Sacramento District, CA. Coordinated the preparation of the Fisheries, Water Quality, Vegetation and Wildlife, Recreation, Transportation, and Air Quality sections of the Environmental Assessment/Initial Study for the USACE proposed modifications to Folsom Dam. The modifications included enlarging the existing river outlets and increasing emergency storage capacity in order to improve flood control operations. Coordinated the development of a two-dimensional hydrologic model to study the movement of spawning gravel in the Lower American River.

Task Leader; Bradshaw Interceptor and Road Widening; Sacramento Regional County Sanitation District; Sacramento, CA. Task Leader for the coordination of all environmental permit activities for construction of a large-diameter sewer interceptor along Bradshaw Road in Sacramento County and the widening of the road from two to four lanes. Permitting agencies included the USACE, U.S. Fish and Wildlife Service, California Department of Fish and Game, Central Valley Regional Water Quality Control Board, and the State Historic Preservation Officer. Managed staff in wetland delineation and special-status species surveys. Coordinated with the County's Department of Environmental Review and Assessment to ensure the completion of CEQA documentation for the project. Managed staff in wetland delineation and special-status species surveys.

Project Manager; American River Watershed Project, Common Features – Archaeological and Biological Monitoring; U.S. Army Corps of Engineers; Sacramento District, CA. Managed a team of contract archaeological and biological monitors. The project involved a series of 120 soil borings along the east levee of the Sacramento River and the Natomas Cross Canal during the summer and fall of 2001. Both the archaeological and biological monitoring required close coordination with the USACE onsite supervisor to communicate monitoring needs and track progress.

Task Leader; Sewer Relocation Project; Vallejo Sanitation and Flood Control District; Vallejo, CA. Task leader for the Vallejo Sanitation and Flood Control District's preparation of a CEQA Initial Study for the relocation of a sewer pipeline near the intersection of State Route 29 and State Route 37. Prepared the entire Initial Study and Mitigated Negative Declaration with input from biological resources specialists. Closely coordinated with state and federal agencies for wetlands and endangered species permitting, because the project was located close to sensitive title marsh habitat.

Water Treatment Plant Expansion; City of Sacramento; CA. Coordinated preparation of the City of Sacramento's EIR to assess the planned expansion of the E.A. Fairbairn and Sacramento River Water Treatment Plants. Prepared and coordinated all impact sections. The EIR required project-level impact considerations including the application of PROSIM, a hydrologic model used to simulate Central Valley Project water deliveries.

Environmental Assessments for Central Valley Wildlife Refuges; U.S. Bureau of Reclamation, Mid-Pacific Region; CA. Coordinated the preparation of three Environmental Assessments for issuance of long-term contracts covering 14 wildlife refuges pursuant to the Central Valley Project Improvement Act. Assisted in execution of the water supply contracts, which provided water to individual wildlife refuges throughout the Central Valley.

Task Leader; Use Permit for Land Treatment of Agricultural Process Wastewater; Colusa Industrial Properties; Colusa, CA. Led the preparation of a CEQA Initial Study for the use of a parcel of land for land disposal of agricultural process wastewater. The Initial Study was required to satisfy Colusa County Use Permit requirements. Prepared entire Initial Study with the assistance of soil scientists and water quality specialists. Assisted in the regulatory process for the issuance of Waste Discharge Requirements by the Central Valley Regional Water Quality Control Board.

Project Manager; Fish Passage Facility; U.S. Fish and Wildlife Service and California Department of Fish and Game; Chico, CA. Project Manager for the preparation of an Environmental Assessment/Initial Study under NEPA and CEQA. Coordinated approval of all necessary environmental permits. Worked with permitting agencies, including USACE, U.S. Fish and Wildlife Service, California Department of Fish and Game, Central Valley Regional Water Quality Control Board, and the State Historic Preservation Officer. The project involved the construction of a new fish passage facility on Durham Mutual Water Company's unscreened diversion on Butte Creek, CA.

Project Manager; Fish Passage Facility; U.S. Fish and Wildlife Service and California Department of Fish and Game; Durham, CA. Project Manager for the preparation of an Environmental Assessment/Initial Study under NEPA and CEQA. Coordinated the approval of all necessary environmental permits. Worked with permitting agencies, including USACE, U.S. Fish and Wildlife Service, California Department of Fish and Game, Central Valley Regional Water Quality Control Board, and the State Historic Preservation Officer. The project involved the construction of a new fish passage facility at Rancho Esquon Partners' unscreened diversion at Adams Dam on Butte Creek, CA.

Project Manager; Pipeline and Pump House Facility; Nevada Irrigation District; Nevada County, CA. Project Manager for the preparation of an Initial Study under CEQA for a 2,500-foot pipeline and pump house facility in rural Nevada County. Coordinated all environmental review processes. The project increased redundancy in Nevada Irrigation District's water supply system by providing emergency supplies to its E. George Water Treatment Plant.

Fish Screens and Gradient Restoration Facility; Glenn-Colusa Irrigation District; Hamilton City, CA. Prepared the land use, transportation, and noise affected environment and environmental consequences section of the EIS/EIR for construction of fish screens and a Gradient Restoration Facility at the Glenn-Colusa Irrigation District diversion on the Sacramento River.

Energy

Water Resources Task Manager; Huntington Beach Energy Project; AES Corp, Inc.; Huntington Beach, CA. Prepared Water Resources analysis for a project to repower the existing Huntington Beach Generating Station in Huntington Beach, CA. A key feature of the repowering project was to remove the existing plant from using once-through ocean cooling. The project involved study of potential recycled water availability from the nearby wastewater treatment plant, requiring study of various pipeline

alignments and advanced treatment options ultimately resulting in a determination that using recycled water for this project was environmentally undesirable and economically unsound. Issues of concern also included changes in ocean discharges and site redevelopment to incorporate advanced stormwater pollution controls.

Water Resources Senior Technical Reviewer; Ivanpah Solar Electric Generating System; Bright Source Energy, Inc.; Mojave Desert, CA. Assisted in the preparation of a Water Resources analysis as a Senior Technical Reviewer. The project included constructing a concentrated solar thermal facility on 1,843 acres of land in the Mojave Desert. Key water resources issues of concern were availability of groundwater for the thermal facility and the disturbance to hydrology from the large construction site.

Water Resources Task Manager; Hidden Hills Solar Electric Generating System; Bright Source Energy, Inc.; Mojave Desert, CA. Prepared the Water Resources analysis for a project to construct a concentrated solar thermal facility on 3,277 acres of land in eastern California, near Pahrump, NV. Key water resources issues of concern were availability of groundwater for the thermal facility, associated drawdown impact to deep-rooted plants such as mesquite, and the disturbance to hydrology from the large construction site.

Water Resources Task Manager; Carlsbad Energy Center Project; NRG, Inc.; Carlsbad, CA. Prepared Water Resources analysis for a project to repower the existing Encina Power Station in Carlsbad, CA, using natural gas turbines. The project involved the use of reclaimed water from the nearby wastewater treatment plant, with an alternative source to use desalinated seawater. Key issues included marine impacts from seawater intake, brine disposal, and the capacity of the existing reclaimed water distribution system.

Water Resources Task Manager; Lompoc Wind Energy Project; Pacific Renewable Energy Generation, LLC.; Santa Barbara, CA. Prepared Water Resources analysis for a project to install 60 to 80 wind turbines and ancillary facilities on 2,950 acres in Santa Barbara County, CA. Key water resources issues of concern included disturbance to onsite water resources from the large extent of construction activities, stormwater quality control, and development of an onsite facilities (including a well and septic system) for the operations units.

Water Resources Task Manager; Eastshore Energy Project; Tierra Energy, Inc.; Hayward, CA. Prepared Water Resources analysis for a new natural gas power plant in Hayward, CA, using 14 reciprocating engine generators. Key water resources issues of concern included the development of structural features for onsite stormwater quality control, and process wastewater discharges to a municipal system.

Water Resources Task Manager; Humboldt Bay Repowering Project; Pacific Gas and Electric, Company; Eureka, CA. Prepared Water Resources analysis for a project to repower the existing Humboldt Bay Power Plant south of Eureka, CA, using ten natural gas powered reciprocating engine generators. Key water resources issues of concern included stormwater quality to an extended detention basin, process wastewater discharges to a municipal system, and the decrease in lagoon flows because of reduced use of the existing once-through cooling system.

Water Resources Task Manager; Application for Certification for San Francisco Electric Reliability Project; Public Utilities District for the City and County of San Francisco, CA. Prepared the Water Resources section of an Application for Certification, a California Energy Commission process that is functionally equivalent to CEQA. The CEQA-equivalent evaluation focused on water, wastewater, and stormwater generation and was used by the proposed facility in the context of Citywide compliance with the federal Clean Water Act and state Porter-Cologne Water Quality Control Act. Work efforts included testimony at evidentiary hearings.

Water Resources Task Manager; Vernon Power Plant; City of Vernon, CA. Prepared Water Resources analysis for a new natural gas power plant in Vernon, CA, using three gas-fired turbines and one steam turbine. The project would redevelop an existing industrial site in this highly industrial community. Key water resources issues of concern included calculating drainage credits based on changes to the existing site drainage patterns, stormwater quality control during construction and operation, availability of recycled water, and the quantity and quality of wastewater discharges.

Water Resources Task Manager; Westley-Marshall Substantion and Transmission Line Project; Turlock Irrigation District; Stanislaus County, CA. Prepared Water Resources analysis for an approximate 12-mile transmission line project in rural Stanislaus County, CA. The project also involved nine potential substation sites. Key water resources issues of concern included floodplain risks and stormwater quality control during construction.

Task Manager; South Bay Replacement Project; LS Power Generation, LLC.; Chula Vista, CA. Task Manager for Water Resources. Prepared Water Resources analysis for a project to repower the existing South Bay Power Plant in Chula Vista, California, using two natural gas turbines and one steam turbine. The project resulted in the abandonment of the existing once-through cooling system used at the power plant. Key water resources issues of concern included stormwater quality during construction, plant operations, and wastewater discharges (quantity and quality).

Senior Technical Reviewer; Chula Vista Energy Upgrade Project; MMC Energy, Inc.; Chula Vista, CA. Senior Technical Reviewer for Water Resources. Assisted in the preparation of a Water Resources analysis. Project replaced existing units with two newer, more efficient natural gas turbines. Efforts included testimony at evidentiary hearings.

Task Manager; Critical Issues Review—Various Sites; Ramco Energy, Inc.; CA. Task Manager for Water Resources. Prepared water resources portion of Critical Issues Review report in support of a Request for Offer by Pacific Gas and Electric Company. The critical issues review covered various sites in Northern California and addressed critical water resources topics, such as water supply availability, wastewater disposal capacity, and discharge limitations.

Task Manager; Modesto Irrigation District Electric Generation Station; Modesto Irrigation District; Ripon, CA. Task Manager for the preparation of the Water Resources section of this Small Power Plant Exemption, a California Energy Commission process that is functionally equivalent to CEQA. The CEQA-equivalent evaluation focused on water, wastewater, and stormwater generation and was used by the proposed facility in compliance with the federal Clean Water Act and state Porter-Cologne Water Quality Control Act.

Task Manager; Applications for Certification for Walnut Creek Energy Park and Sun Valley Energy Project; Edison Mission Energy; City of Industry/Romoland, CA. Provided support for two Applications for Certification before the California Energy Commission for similarly designed 500-MW natural gas-fired peaking power plants, using the GE LMS100 advanced gas turbine technology.

Task Manager; Application for Certification for Roseville Energy Park; Roseville Electric; Roseville, CA. Provided support for an Application for Certification before the California Energy Commission for a 160-MW natural gas-fired power plant in Roseville, CA.

Senior Technical Reviewer; GWF Energy Tracy Combined Cycle Conversion Project; San Joaquin County, CA. Senior Technical Reviewer for Water Resources. Assisted in the preparation of a Water Resources analysis. The project updated an existing peaking plant to a combined-cycle facility. Key water resources issues of concern included availability of groundwater for the thermal facility and the disturbance to hydrology and water quality.

Supplemental Information

Years Experience Prior to CH2M HILL: 9

CH2M HILL Hire Date: 6/22/1999

Appendix B
Declarations

DECLARATION OF
STEPHEN O'KANE

I, Stephen O'Kane, declare as follows:

1. I am presently employed by AES Alamitos Energy, LLC as a Vice President.

2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.

3. The testimony on Project Description, Compliance, Alternatives, Air Quality, and Public Health for the Alamitos Energy Center project (13-AFC-01) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed herein.

5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 10/14/16

Signed: S O'Kane

DECLARATION OF
Jerry Salamy

I, Jerry Salamy, declare as follows:

1. I am presently employed by CH2M HILL as Principal Project Manager.

2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.

3. The testimony on Project Description, Air Quality, Compliance, Hazardous Materials Handling, Public Health, Waste Management, Worker Health and Safety, and Alternatives for the Alamitos Energy Center project (13-AFC-01) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed herein.

5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 10/13/16

Signed: 

DECLARATION OF
Robert Sims

I, Robert Sims, declare as follows:

1. I am presently employed by The AES Corporation as a Project Director.

2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.

3. The testimony on Transmission System Engineering and Safety for the Alamitos Energy Center project (13-AFC-01) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed herein.

5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 10/12/16 Signed: 

DECLARATION OF
Melissa Fowler

I, Melissa Fowler, declare as follows:

1. I am presently employed by Butier, Construction Managers, Consulting Engineers as Biological Compliance.

2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.

3. The testimony on Biological Resources for the Alamitos Energy Center project (13-AFC-01) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed herein.

5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 10/13/2016 Signed: Melissa Fowler

DECLARATION OF
Natalie J. Lawson

I, Natalie J. Lawson, declare as follows:

1. I am presently employed by CH2M HILL as a cultural resources specialist.

2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.

3. The testimony on Cultural Resources for the Alamitos Energy Center project (13-AFC-01) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed herein.

5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: October 13, 2016 Signed: 

DECLARATION OF
Thomas A. Lae

I, **Thomas A. Lae**, declare as follows:

1. I am presently employed by **CH2M** as **Geologist/Project Manager**.

2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.

3. The testimony on **Geologic Hazards and Resources** for the Alamitos Energy Center project (13-AFC-01) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed herein.

5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 10/11/16

Signed: 

DECLARATION OF
Aarty Joshi, AICP

I, Aarty Joshi, declare as follows:

1. I am presently employed by CH2M as Senior Project Manager.

2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.

3. The testimony on Land Use for the Alamitos Energy Center project (13-AFC-01) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed herein.

5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 10/11/2016 Signed: 

DECLARATION OF
CINDY SALAZAR

I, Cindy Salazar, declare as follows:

1. I am presently employed by CH2M as an Environmental Planner.

2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.

3. The testimony on Land Use and Waste Management for the Alamitos Energy Center project (13-AFC-01) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed herein.

5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: October 13, 2016 Signed: Cindy Salazar

DECLARATION OF
Mark Bastasch

I, Mark Bastasch, declare as follows:

1. I am presently employed by CH2M as a Principal Engineer.

2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.

3. The testimony on Noise and Vibration for the Alamitos Energy Center project (13-AFC-01) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed herein.

5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: October 10, 2016 Signed: Mark Bastasch

DECLARATION OF
James R. Verhoff

I, James R. Verhoff, declare as follows:

1. I am presently employed by CH2M Hill as a staff paleontologist.

2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.

3. The testimony on paleontological resources for the Alamitos Energy Center project (13-AFC-01) was reviewed by me, based on my independent analysis, data from reliable sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed herein.

5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 10/11/16

Signed: James R Verhoff

DECLARATION OF
Fatuma Yusuf

I, Fatuma Yusuf, declare as follows:

1. I am presently employed by CH2M as a Senior Economist.

2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.

3. The testimony on Socioeconomics for the Alamitos Energy Center project (13-AFC-01) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed herein.

5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 10/12/16

Signed: 

DECLARATION OF
Steven P. Long

I, Steven P. Long, declare as follows:

1. I am presently employed by CH2M, Inc. as a project manager/wetland scientist.

2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.

3. The testimony on Section 5.11. Soils for the Alamitos Energy Center project (13-AFC-01) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed herein.

5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: October 10, 2016 Signed: Steven P. Long

DECLARATION OF
Loren Bloomberg

I, Loren Bloomberg, declare as follows:

1. I am presently employed by CH2M as a Principal Technologist.

2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.

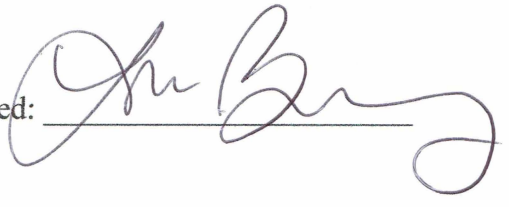
3. The testimony on Traffic and Transportation for the Alamitos Energy Center project (13-AFC-01) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed herein.

5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 10/11/16

Signed: 

DECLARATION OF
Thomas Priestley, Ph.D. AICP/ASLA

I, Thomas Priestley, declare as follows:

1. I am presently employed by CH2M as a Senior Environmental Planner.

2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.

3. The testimony on Visual Resources for the Alamitos Energy Center project (13-AFC-01) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed herein.

5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: October 11, 2016

Signed: Thomas J. Priestley

DECLARATION OF
MATTHEW FRANCK

I, Matthew Franck, declare as follows:

1. I am presently employed by CH2M as Senior Project Manager.

2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.

3. The testimony on Water Resources for the Alamitos Energy Center project (13-AFC-01) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed herein.

5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 10/13/2016

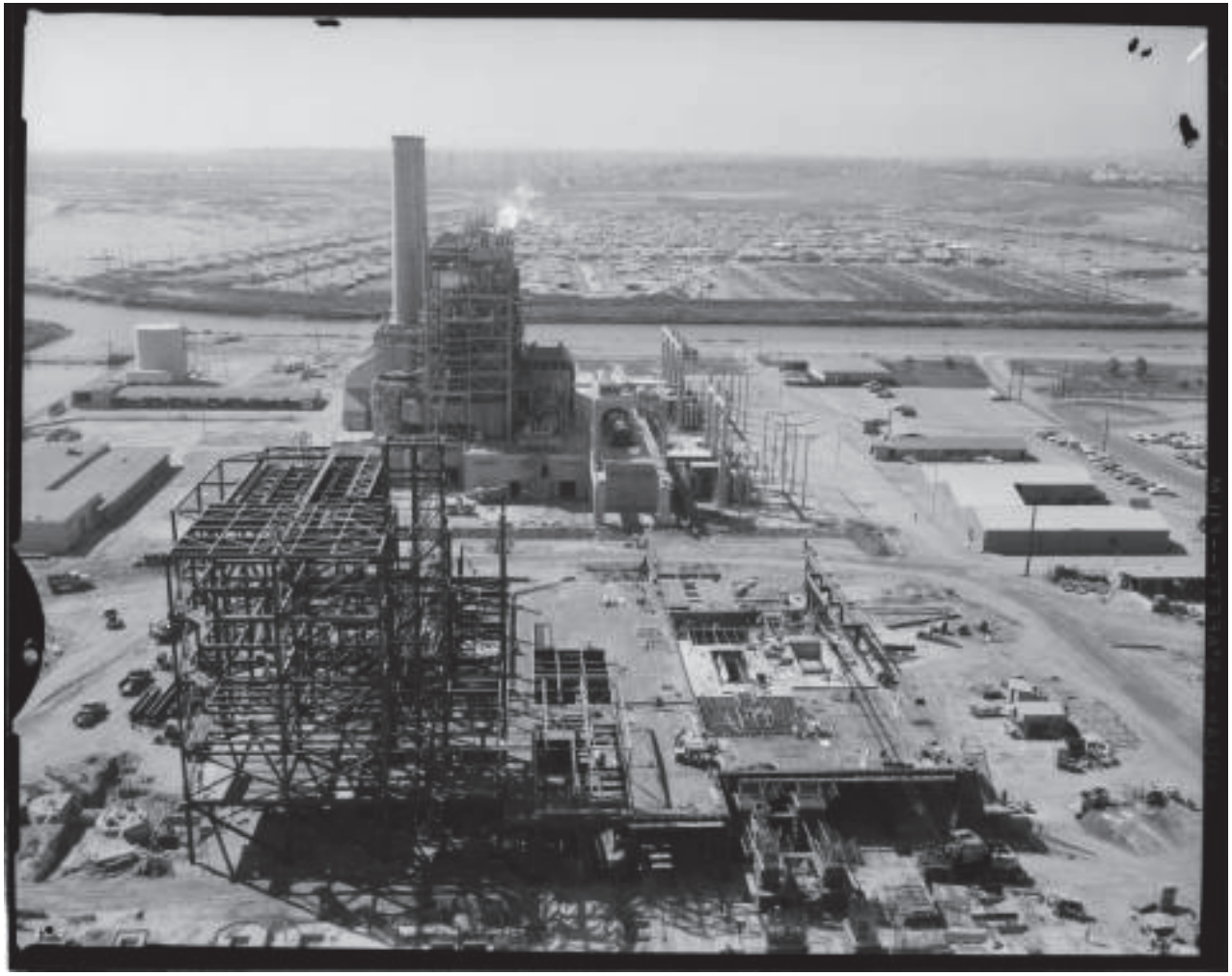
Signed: 

Appendix C
Cultural Resources Figures

Appendix C, Figure 1-1
Applicant's Testimony
Alamitos Energy Center
Long Beach, California

Appendix C, Figure 1-2
Applicant's Testimony
Alamitos Energy Center
Long Beach, California

Appendix C, Figure 1-3
Applicant's Testimony
Alamitos Energy Center
Long Beach, California



Appendix C, Figure 1-4
Applicant's Testimony
Alamitos Energy Center
Long Beach, California

Appendix C, Figure 1-5
Applicant's Testimony
Alamitos Energy Center
Long Beach, California

Appendix C, Figure 2-1
Applicant's Testimony
Alamitos Energy Center
Long Beach, California

Appendix C, Figure 2-2
Applicant's Testimony
Alamitos Energy Center
Long Beach, California

Appendix C, Figure 2-3
Applicant's Testimony
Alamitos Energy Center
Long Beach, California

Appendix C, Figure 2-4
Applicant's Testimony
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Appendix C, Figure 2-5
Applicant's Testimony
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Appendix C, Figure 2-6
Applicant's Testimony
Alamitos Energy Center
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Appendix C, Figure 2-7
Applicant's Testimony
Alamitos Energy Center
Long Beach, California

Appendix C, Figure 2-8
Applicant's Testimony
Alamitos Energy Center
Long Beach, California

Appendix C, Figure 3-1
Applicant's Testimony
Alamitos Energy Center
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Appendix C, Figure 3-2
Applicant's Testimony
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Appendix C, Figure 3-3
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Appendix C, Figure 3-4
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Appendix C, Figure 3-5
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Alamitos Energy Center
Long Beach, California

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Appendix C, Figure 4-1
Applicant's Testimony
Alamitos Energy Center
Long Beach, California

Appendix C, Figure 4-2
Applicant's Testimony
Alamitos Energy Center
Long Beach, California

ch2m

Appendix C, Figure 4-3
Applicant's Testimony
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Long Beach, California

Appendix C, Figure 4-4
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Appendix C, Figure 4-5
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Appendix C, Figure 4-6
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Appendix C, Figure 4-7
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Alamitos Energy Center
Long Beach, California

Appendix C, Figure 4-8
Applicant's Testimony
Alamitos Energy Center
Long Beach, California

Appendix C, Figure 4-9
Applicant's Testimony
Alamitos Energy Center
Long Beach, California