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Project Description

PRP is a natural-gas-fired, simple-cycle, water-cooled, electrical generating facility with a nominal net output of 100 MW that will replace the San Gabriel Facility, an existing and operating power plant in Pomona, California. PRP will be located on a 2-acre parcel in the City of Pomona in Los Angeles County and located in the Pomona Valley, directly 28 miles east of the city of Los Angeles (Figure 2-1). PRP will be powered by one General Electric LMS100 gas turbine. The balance of plant equipment will include natural gas compressors, water treatment facilities, emergency services, administration/maintenance building and a cooling tower to provide gas turbine compressor inter-stage and auxiliary cooling.

PRP will include the removal of the existing LM5000 gas turbine currently in operation. Demolition of the existing facility, expected to take 3 months and to occur in the first half of 2017, will provide the space required for the construction of PRP. Project construction is expected to take approximately 16 months (3rd Quarter 2017 to 4th Quarter 2018). Commissioning is scheduled to start in the fourth quarter of 2018 and be completed by the first quarter of 2019.

PRP will use existing supply and discharge lines including natural gas, potable and recycled water supply, process wastewater, and sanitary wastewater. Consistent with the intent of the Governor's Executive Order No. B-29-15, dated April 1, 2015, the project will use recycled water from the Pomona WRP for cooling and appropriate process water uses.

The LMS100 will use the existing 66-kV Simpson transmission line connected to SCE's 66-kV Ganesha-Simpson transmission line. The existing poles will be upgraded with new conductors to account for the additional power generated by the LMS100.

2.1 Facility Description, Design, and Operation

PRP has been designed using commercially proven technology equipped with monitoring, protection, and safety systems to provide safe and reliable operation over a 30-year operating life. It will consist of a single simple-cycle gas turbine power block, being able to be controlled remotely in the PRP control room.

The PRP power block will use existing utilities and include the following principal design elements:

- One General Electric LMS100PA CTG with a nominal net rating of 100 MW.[2] The CTG will be equipped with evaporative coolers on the inlet air system, compressor inter-stage cooling, and water injection to control NO_x
- Increase the height of the exhaust stack from 75 to 90 feet tall
- One multi fan, induced draft cooling tower
- Two fuel gas compressors
- One 10,000-gallon ammonia storage tank containing 19 percent aqueous ammonia (same size as existing tank)
- One demineralized water treatment system
- Approximately 0.2 mile of reconductored 66-kV transmission line (generation tie-line, or gen-tie line) connecting to the Ganesha-Simpson transmission line (see Section 3, Transmission Systems Engineering)

[2] The capabilities listed are based in ISO conditions

- Existing natural gas pipeline
- Existing potable and recycled water supply lines
- Existing stormwater, sanitary sewer, and wastewater lines

2.1.1 Site Arrangement and Layout

Primary access to the PRP site will be provided from an access road off Mt. Vernon Avenue, just east of the intersection with Erie Street. Figure 2.1-1 shows the facility site plan and general arrangement. Figures 2.1-2a, and 2.1-2b show typical elevation views of the project.

PRP is bounded by industrial warehouse structures to the north, east and west. A large rectangular warehouse structure adjoins PRP to the south, bordered by rail lines.

The project site will include two 200,000-gallon water storage tanks located on the north side of the site, one 10,000-gallon, 19 percent aqueous ammonia storage tank with an unloading area located on the east side of the site, a water treatment area, a storage warehouse/admin building and a gas compressor enclosure all located on the west site of the site.

The primary source of fire protection water for the project will be the existing county fire main.

2.1.1.1 Pipelines

The facility does not require any new pipelines.

Natural Gas Supply Pipeline. Natural gas is currently available onsite. A new gas compressor/pressure control station, and gas scrubber/filtering equipment will be constructed by the project owner as part of the project. Natural gas will then be distributed onsite to the combustion turbine.

Raw Water Supply Pipeline. PRP's process water needs will be provided by an existing 8-inch diameter pipeline from the city's recycled water system. Recycled water will be treated and used in the cooling towers, evaporative cooler and for LMS100 water injection for NO_x control.

Wastewater Discharge Pipeline. Wastewater generated by PRP (primarily cooling tower blowdown) will be sent to the existing wastewater discharge point. Sanitary wastewater will be discharged to the existing sanitary waste discharge point.

2.1.2 Overview of Construction Activities

Construction of PRP will be coordinated with the demolition of the existing San Gabriel Facility so that site impacts are minimized. Due to space limitations at the site, site demolition will be completed prior to the start of construction.

2.1.3 Process Description

As discussed previously, PRP will consist of the following equipment: one General Electric LMS100PA CTG equipped with water injection to control NO_x, inter-stage compressor, and evaporative coolers for reducing inlet air temperatures. Auxiliary equipment includes: cooling tower for heat load rejection, SCR systems for NO_x emissions control, oxidation catalyst equipment to control carbon monoxide (CO) and VOC emissions, and a fuel gas compressor and regulating station.

The heat balances for a range of ambient conditions including the annual average and peak ambient conditions are shown in Figure 2.1-3. The use of the evaporative coolers is not intended as power augmentation, but rather will be employed to mitigate CTG degradation (ambient and mechanical) to maintain the facility at or near the nominal generating capacity. The predicted net electrical output of PRP under these conditions is approximately 97.8 MW at a heat rate of approximately 8,244 British thermal units per kilowatt hour (Btu/kWh) on a lower heating value (LHV) basis. This corresponds with a thermal efficiency of approximately 41.4 percent on a LHV basis.

The combustion turbine will include the use of best available control technology (BACT) to limit emissions of criteria pollutants and hazardous air pollutants (HAPs). NO_x will be controlled to 2.5 parts per million by volume, dry basis (ppmvd), corrected to 15 percent oxygen through the use water injection and SCR. An oxidation catalyst will also be used to control CO emissions to 4.0 ppmvd at 15 percent oxygen and VOCs emissions to 2.0 ppmvd at 15 percent oxygen. BACT for particulate matter (with a diameter less than 10 and 2.5 microns [PM_{10} and $PM_{2.5}$, respectively]) and sulfur dioxide (SO_2) will be the exclusive use of natural gas with a sulfur content not to exceed 0.75 grains per 100 standard cubic feet natural gas (gr/100 scf) on a short term basis and 25 gr/100 scf on an annual average basis. Emissions of excess ammonia (ammonia slip) not used in the SCR process will be limited to 5.0 ppmvd at 15 percent oxygen.

2.1.4 System Process

CTG combustion air will flow through the inlet air filters, evaporative inlet air coolers, and associated air inlet ductwork before being compressed in the CTG compressor section and then entering the CTG combustion sections. The LMS100 has additional inter-stage cooling in the compressor section to increase efficiency. Natural gas will be mixed with the compressed air prior to being introduced to the combustion sections and ignited. The hot combustion gases will expand through the power turbine section of the CTG, causing them to rotate and drive the electric generator and CTG compressor. The hot combustion gases will exit via the exhaust stack.

2.1.5 Major Generating Facility Components

The following paragraphs describe the major components of PRP.

2.1.5.1 Combustion Turbine Generator

Natural gas combustion in the CTG will produce thermal energy, which is converted into mechanical energy required to drive the combustion turbine compressor and electrical generator. The CTG system will contain supporting systems and associated auxiliary equipment. The combustion turbine will drive an air cooled synchronous generator.

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

- Inlet air filter, inlet silencer, and evaporative cooler
- Metal acoustical enclosure
- Lubrication oil system for the combustion turbine and the generator
- Water injection for NO_x control system
- Inter-stage compressor cooling system
- Compressor wash system
- Fire detection and protection system (using carbon dioxide [CO_2])
- Fuel gas system, including flow meter, strainer, and duplex filter
- Starter system
- Turbine controls
- Totally enclosed water-to-air cooling or direct air-cooled synchronous generator
- Generator controls, protection, excitation, power system stabilizer, and automatic generation control

The CTG and accessory equipment will be contained in acoustical enclosures to minimize noise.

2.1.6 Catalyst Housing

The CTG is equipped with catalyst modules to further reduce emissions. The SCR emission control system will use ammonia vapor in the presence of a catalyst to reduce CTG exhaust gas NOx. Diluted ammonia (NH3) vapor will be injected into the exhaust gas stream via a grid of nozzles located upstream of the catalyst module. The subsequent chemical reaction will reduce NOx to nitrogen and water.

An oxidation catalyst will also be installed within the housing casing to control the concentration of CO in the exhaust gas emitted to atmosphere to no greater than 4 parts per million (ppm). The exhaust from the CTG and catalyst will be discharged from an exhaust stack. The LMS100 exhaust stack will be 90 feet tall.

2.1.7 Major Electrical Equipment and Systems

The bulk of the electric power produced by PRP will be transmitted to the electrical grid through 66-kV generation-tie (gen-tie) line through the SCE's Ganesha-Simpson transmission line, which will be reconductored (Figure 1.2-3). A small amount of electric power will be used onsite to power auxiliary equipment such as gas compressors, pumps and fans, control systems, and general facility loads including lighting, heating, and air conditioning. A station battery system will also 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.

2.1.7.1 Alternating Current Power—Transmission

Power will be generated by the LMS100 CTG at 13.8 kV and stepped up by fan-cooled generator step-up (GSU) transformers to 66-kV line for transmission to the grid. Auxiliary power will be fed from the 13.8-kV side of the CTG through separate station unit service transformers, which will step the power down to 4.16 kV. The 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 transformer from surges on the 66-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. The high-voltage side of the GSU transformer will be connected to switchyard circuit breakers and associated equipment with the SCE high-voltage transmission system. Section 3, Transmission System Engineering, presents additional information regarding the electrical transmission system. Figure 2.1-4 is a one-line diagram of the facility's electrical system.

2.1.7.2 Alternating Current Power—Distribution to Auxiliaries

Auxiliary power for PRP will be supplied at 4.16-kV and 480 volts alternating current (AC) by a double-ended 4.16-kV switchgear lineup and a double-ended 480-volt load center substation arrangement. One 13.8-kV/4.16-kV station unit service transformer 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 load center transformer. The high-voltage side of the station unit service transformer will be connected to a tap on the 13.8-kV isolated phase bus duct which connects the generator to the GSU transformer low voltage (secondary) winding. The 4.16-kV switchgear lineup will supply power to the large motor loads, the fuel gas compressors, the combustion turbine starting system, the generator excitation system, and to the load center transformers for 480-volt power distribution. The 4.16-kV switchgear will have circuit breakers for the main incoming feeds and for power distribution. The combustion turbine starting system and the generator excitation system will be powered through a transformer that will be connected through taps on the 13.8-kV isolated phase bus.

The load center transformer will supply 480-volt, three-phase power to the CTG and balance-of-plant 480-volt motor control centers (MCCs).

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.

2.1.7.3 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.

2.1.7.4 125-volt DC Power Supply System

PRP 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. The 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 bus provides 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.

2.1.7.5 Uninterruptible Power Supply System

PRP will have a critical service 120-volt AC, single-phase, 60-hertz bus. It will be powered with a UPS 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 (CEMS), 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.

2.1.8 Fuel System

The CTG will only combust natural gas. The natural gas requirement during operation at site normal ambient conditions[3] is approximately 842 MMBtu/hr (LHV basis).

Natural gas will be delivered to the site from an existing pipeline connecting to the SoCalGas high-pressure natural gas supply. The high-pressure natural gas pipeline operates at a nominal approximately 300 pounds per square inch (psi). The natural gas will flow through a flow-metering station, a gas pressure control station, gas compression equipment, and gas scrubber/filtering equipment (housed in a separate building to attenuate noise), prior to entering the PRP CTG.

2.1.9 Plant Cooling Systems

The plant heat rejection system will consist of a multi-fan wet cooling tower and closed cooling water heat exchangers. The heat rejection system will be used to cool GT compressed air, lube oil, control oil, and gas compressors. Recycled water will be used in the cooling towers.

2.1.10 Water Supply and Use

Figure 2.1-5 provides the water balances for PRP representing multiple operating conditions. The water balances show operation under a range of site ambient temperature conditions[3] with the CTG at 100 percent load with CTG inlet air evaporative cooling operating. PRP will use recycled water that is treated and demineralized onsite. Make up recycled water will be provided by an existing 8-inch pipeline.

2.1.10.1 Water Requirements

The maximum theoretical water needs for PRP is based on one LMS100 gas turbine in operation for 3,800 hours annually, as shown in Table 2.1-1, are:

- For the site average conditions, the plant's water use will be approximately 315 gpm.
- For the summer peak conditions, station maximum water use will be approximately 350 gpm.
- Assuming 3,800 annual operating hours, the water use is approximately 220.2 acre-feet per year (afy).

Table 2.1-1. Estimated Daily and Annual Water Use for PRP Operations
Small Power Plant Exemption Application for the Pomona Repower Project

Water Use	Average Daily Use Rate (gpm)	Maximum Daily Use Rate (gpm)	Average Annual Use* (afy)
Recycled	244.1	271.5	170.8
Potable	70.6	78.5	49.4
Total	**314.7**	**350**	**220.2**

*Assumes 3,800 hours of LMS100 operation

PRP makeup water will be fed directly from the recycled water supply through metering equipment and into the 200,000-gallon service water tank. Water from the service water tank will be used as plant service water, irrigation water, and raw feed to the demineralized water treatment system. The cooling tower make up will be supplied directly from recycled water supply. The service water storage tank will provide approximately 48 hours of continuous operational storage in the event of a disruption in the supply.

2.1.10.2 Wastewater Requirements

The PRP wastewater requirements, while operating at a theoretical maximum operating hours described above, as shown in Table 2.1-2, are:

- For the site average ambient temperature conditions, wastewater discharge will be approximately 51.6 gpm.
- For the site peak summer ambient temperature conditions, wastewater discharge will be approximately 54.9 gpm.
- Annual total discharge assuming 3,800 hours of LMS100 operation will be 37.5 acre-feet.

Table 2.1-2. Estimated Daily and Annual Wastewater Discharge for PRP Operations
Small Power Plant Exemption Application for the Pomona Repower Project

Wastewater Use	Average Daily Discharge Rate (gpm)	Maximum Daily Discharge Rate (gpm)	Average Annual Use* (afy)
Wastewater to sewer system	53.6	56.9	37.5

* Assumes 3,800 hours of LMS100 operation

[3] Average conditions are 74°F (dry bulb) and 31 percent relative humidity.

Sanitary/domestic wastewater will be discharged to the existing sewer system.

2.1.10.3 Water and Wastewater Treatment

Makeup water for the PRP power block will have contaminants removed (demineralized) by passing the recycled water through a reverse osmosis system followed by a continuous electrodeionization (EDI) process. The demineralized water will be sent to a 200,000 gallon storage tank. It will provide approximately 48 hours of storage at the maximum daily use rate. Demineralized water is used for CT water injection, evaporative cooler makeup and for combustion turbine wash water.

- Evaporative cooler blowdown (water removed from the system to reduce water contaminants) will be recycled as make up to the cooling tower.
- 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 equipment wash down, and other miscellaneous plant uses.
- Condensate from the LMS100 combustion turbine intercooler will be recycled as make up to the cooling tower.
- Wastewater 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 wash downs. The oil-free water from the process areas and from the pavement areas will be recycled and sent to the treated wastewater tank. The residual oil containing sludge will be collected via vacuum truck and disposed appropriately by a licensed transporter.

2.1.10.4 Closed-loop Cooling Fluid Cooler

A closed-loop cooling system will provide cooling water for various pieces of plant equipment such as the fuel gas compressors, CTG lubrication oil coolers, and CTG intercoolers.

To provide increased efficiency, the LMS100 design has incorporated compressor inter-stage cooling. The current design sends hot air from the low pressure compressor at temperatures above 250˚F to a high-temperature intercooler where the air is cooled and then sent back to the turbine for further compression. The cooler air requires less energy to be compressed so additional output will be seen at the generator. This increased output improves the plants overall efficiency.

2.1.11 Emission Control and Monitoring

Air emissions from the combustion of natural gas in the CTG will be controlled using state-of-the-art systems. To ensure that the systems perform correctly, continuous emission monitoring will be performed on the stack exhaust flow rate, temperature, oxygen, NO_x and CO levels, as well as on the natural gas heat input, generator output, and ammonia injection rate into the pollution control system. Section 4.1, Air Quality, includes additional information on emission control and monitoring.

2.1.11.1 NO_x Emission Control

The PRP gas turbine is designed to be a fast-start and fast-ramp unit that will require an immediate and varying supply of ammonia at precise concentrations for emissions control. The PRP generating unit will be supported by one 19 percent aqueous ammonia storage tank and ammonia injection grid to supply ammonia to the SCR system.

SCR will be used to control NO_x concentrations in the exhaust gas emitted to the atmosphere to 2.5 ppmvd from the gas turbine stack. Ammonia slip, or the concentration of unreacted ammonia in the exiting exhaust gas, will be limited to 5.0 ppmvd from the gas turbine stack. The SCR equipment will include a mixing chamber, catalyst modules, ammonia storage system, ammonia vaporization and injection system, and monitoring equipment and sensors. PRP will make use of an ammonia delivery system, which will consist of one 10,000-gallon ammonia tank, a spill containment basin, and a refilling station with a spill containment basin and sump.

2.1.11.2 Carbon Monoxide and Volatile Organic Compounds

An oxidizing catalytic converter will be used to reduce the CO concentration in the exhaust gas emitted to the atmosphere from the stack to 4.0 ppmvd and VOCs to 2.0 ppmvd.

2.1.11.3 Particulate Emission Control

Particulate emissions will be controlled by the use of best combustion practices and sole use of inherently low sulfur natural gas. A high-efficiency CTG inlet air filtration system will remove particulates in the ambient air prior to entering the CTG processes.

2.1.11.4 Continuous Emission Monitoring

Continuous emission monitors will sample, analyze, and record fuel gas flow rate, NO_x and CO concentration levels, and percentage of oxygen in the exhaust gas from the sack. This system will generate reports of emission data in accordance with permit requirements and will send alarm signals to the plant supervisory control system when emissions approach or exceed pre-selected limits.

2.1.12 Waste Management

Waste management is the process whereby all wastes produced at PRP are properly collected, contained, treated if necessary, and disposed of. Wastes include process and sanitary wastewater, nonhazardous waste (liquid and solid), hazardous waste (liquid and solid) and sanitary waste. Waste management is discussed in more detail in Section 4.5.

2.1.12.1 Stormwater Collection, Treatment, and Disposal

Stormwater that falls within process equipment containment areas will be collected and discharged to the process drain system, which consists of oil/water sumps and separator. Stormwater that falls within the paved areas of the plant area and outside the process equipment containment areas will be routed to the existing storm drain. The oil-free water from the process areas will be recycled once treated and sent to the raw water tank or cooling tower basin. The residual oil-containing sludge will be collected via vacuum truck and disposed of as hazardous waste. The water balance diagram, Figure 2.1-5, shows the expected wastewater streams. Table 2.1-2 shows the flow rates for PRP for the annual average and maximum daily conditions.

2.1.12.2 Plant Drains and Oil/Water Separator

General PRP plant drains will collect containment area wash down and drainage from facility equipment drains. Water from these areas will be collected in a system of floor drains, hub drains, sumps, and piping and routed to the process drain collection system. Drains that potentially could contain oil or grease will first be routed through an oil/water separator. Wastewater streams that are unlikely to contain oil and grease, including CTG inlet air evaporative cooler blowdown and blowdown from the cooling system will bypass the oil/water separator. Miscellaneous wastewaters, including those from combustion turbine water washes and from some water treatment system’s cleaning operations, will be collected in holding tanks or sumps and will be trucked offsite for disposal at an approved wastewater disposal facility.

2.1.12.3 Sanitary Wastewater

Sanitary wastewater generated by PRP will be discharged to the sewer main that services the existing San Gabriel Facility.

2.1.12.4 Solid Wastes

PRP will produce maintenance and plant wastes typical of power generation operations. Generation plant wastes include oily rags, broken and rusted metal and machine parts, defective or broken electrical materials, empty containers, and other solid wastes, including the typical refuse generated by workers. Solid wastes will be trucked offsite for recycling or disposal (see Section 4.5).

2.1.12.5 Hazardous Wastes

Several methods will be used to properly manage and dispose of hazardous wastes generated by PRP. Waste lubricating oil will be recovered and recycled by a waste oil recycling contractor. Spent lubrication oil filters will be disposed of in a Class I landfill. Spent SCR and oxidation catalysts will be recycled by the supplier or disposed of in accordance with regulatory requirements. Workers will be trained to handle hazardous wastes generated at the site.

Chemical cleaning wastes will consist of alkaline and acid cleaning solutions used during pre-operational chemical cleaning and in turbine wash waters. These wastes, which are subject to high metal concentrations, will be temporarily stored onsite in portable tanks or sumps, and disposed of offsite in accordance with applicable regulatory requirements.

2.1.13 Management of Hazardous Materials

A variety of chemicals will be stored and used during construction and operation of PRP. The storage, handling, and use of all chemicals will be conducted in accordance with applicable LORS. Chemicals will be stored in appropriate chemical storage facilities. Bulk chemicals will be stored in storage tanks, and most other chemicals will be stored in returnable delivery containers. Chemical storage and chemical feed areas will be designed to contain leaks and spills. Concrete containment pits and drain piping design will allow a full-tank-capacity spill without overflowing the containment area. For multiple tanks located within the same containment area, the capacity of the largest single tank will determine the volume of the containment area and drain piping. Containment areas subject to rainfall will be provided additional containment volume sufficient to contain the rainfall from a 25-year, 24-hour storm event. Drain piping for reactive chemicals will be trapped and isolated from other drains to eliminate noxious or toxic vapors.

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

A list of the chemicals anticipated to be used at PRP and their storage locations is provided in Section 4.5, Hazardous Materials and Waste Management. The list identifies each chemical by type, intended use, and estimated quantity to be stored onsite.

2.1.14 Fire Protection

The fire protection system is designed to protect personnel and limit property loss and plant downtime in the event of a fire. The source of fire protection water will be supplied by the existing county fire main, which will be configured in accordance with National Fire Protection Association (NFPA).

Fire protection water will be provided to a dedicated underground fire loop piping system. The fire hydrants and the fixed suppression systems will be supplied from the fire-water loop. Fixed fire suppression systems will be installed at determined fire risk areas. Sprinkler systems also will be installed in the administration/ maintenance building as required by NFPA and local code requirements. The CTG will be protected by a CO_2 fire protection system. Hand-held fire extinguishers of the appropriate size and rating will be located in accordance with NFPA 10 throughout the facility.

Section 4.5, Hazardous Materials and Waste Management, includes additional information on fire, and Section 4.10, Socioeconomics, provides information on local fire protection capability.

2.1.15 Plant Auxiliaries

The following systems will support, protect, and control the generating facility.

2.1.15.1 Lighting

PRP will be operational (though not necessarily generating power) 24 hours per day, 7 days per week and will require night lighting for safety and security. The lighting system will provide illumination for operation under normal conditions, for safety under emergency conditions, and for manual operations during a power outage. The system will also provide 120-volt convenience outlets for portable lamps and tools.

To reduce offsite lighting impacts, lighting for PRP will be restricted to areas required for safety and operation. Exterior lights will be hooded and will be directed onsite to minimize glare and light spill off of the site. Low-pressure sodium lamps and fixtures of a non-glare type will be specified. In addition, switched lighting circuits will be provided for areas where lighting is not required for normal operation or safety to allow these areas to remain dark at most times and to minimize the amount of lighting potentially visible offsite.

2.1.15.2 Grounding

The electrical system is susceptible to ground faults, lightning, and switching surges that result in high voltage that constitutes a hazard to personnel and electrical equipment. The station grounding system provides an adequate path to permit the dissipation of current created by these events.

The station grounding grid will be designed for adequate capacity to dissipate the ground fault current from the ground grid under the most severe conditions in areas of high ground fault current concentration. The grid spacing will maintain safe voltage gradients. Bare conductors will be installed below grade in a grid pattern. Each junction of the grid will be bonded together by an exothermic weld. Ground resistivity readings will be used to determine the necessary numbers of ground rods and grid spacing to ensure safe step and touch potentials under severe fault conditions. Grounding conductors will be brought from the ground grid to connect to building steel and non-energized metallic parts of electrical equipment.

2.1.15.3 Distributed Control System

The DCS provides modulating control, digital control, monitoring, and indicating functions for the plant power block systems.

The DCS will provide the following functions:

- Coordinate control of the CTG and other systems
- Control the balance-of-plant systems in response to plant demands
- Monitor controlled plant equipment and process parameters and deliver this information to plant operators
- Provide control displays (printed logs, LCD video monitors) for signals generated within the system or received from input/output
- Provide consolidated plant process status information through displays presented in a timely and meaningful manner
- Provide alarms for out-of-limit parameters or parameter trends, display on alarm video monitor(s), and record on an alarm log printer
- Provide storage and retrieval of historical data

The DCS will be a redundant microprocessor-based system and will consist of the following major components:

- PC-based operator consoles with LCD video monitors
- Input/output cabinets
- Historical data unit
- Printers
- Data links to the combustion turbine and steam turbine control systems

The DCS will have a functionally distributed architecture allowing integration of balance-of-plant equipment that may be controlled locally via a programmable logic controller. The DCS will interface with the CTG systems to provide remote control capabilities, as well as data acquisition, annunciation, and historical storage of turbine and generator operating information. The system will be designed with sufficient redundancy to preclude a single device failure from significantly affecting overall plant control and operation. This also will allow critical control and safety systems to have redundancy of controls and a UPS. As part of the quality control program, daily operator logs will be available for review to determine the status of the operating equipment.

2.1.15.4 Cathodic Protection

The cathodic protection system will be designed to control the electrochemical corrosion of designated metal piping buried in the soil. Depending on the corrosion potential and the site soils, either passive or impressed current cathodic protection may be provided.

2.1.15.5 Service Air

The service air system will supply compressed air to hose connections for general plant use. Service air headers will be routed to hose connections located at various points throughout the facility. The instrument air system will provide the source of air for the service air system. Each service air header will include a backpressure regulating valve to maintain a minimum instrument air system pressure, regardless of service air use. For purposes of reliability, PRP will have two 100-percent-capacity air compressors. The service air and instrument air system will feed from the same compressors, but the service air system will be segregated by a back pressure control valve that will close in the event of excessive pressure loss in the service air system.

2.1.15.6 Instrument Air

The instrument air system will provide dry air to pneumatic operators and devices. An instrument air header will be routed to locations within the facility equipment areas and within the water treatment facility where pneumatic operators and devices will be located.

2.1.16 Interconnection to the Electrical Grid

The PRP power block will be connected to a two-winding, three-phase, GSU transformer. A single-circuit overhead transmission line will be reconductored to connect PRP to the existing Simpson 66-kV sub gen-tie. Refer to Section 3, Transmission System Engineering, for additional information on the switchyard and generation tie lines.

2.2 Demolition Activities

Construction of PRP will require the removal of existing San Gabriel Facility. The demolition of the existing plant, scheduled to occur in the first half of 2017, provides the space for construction of PRP. The existing San Gabriel Facility was not licensed through the CEC because it is less than 50 MW (net). Therefore, without development of PRP, the City of Pomona would issue the necessary permit for demolition. However, to ensure a comprehensive review of potential project impacts, the demolition of existing San Gabriel Facility is included in this application as part of the project.

2.2.1 Demolition Manpower

Manpower loads will vary depending on the specific activities being performed. Various skill sets will be required for equipment operation, truck driving, dismantling of structures, health and safety monitoring, sampling, general housekeeping, etc. It is anticipated that the maximum number of demolition personnel during any specific demolition activity will be approximately 30, with an overall average demolition workforce of 23 personnel.

2.2.2 Demolition Equipment

Equipment anticipated to be used for the demolition of the existing San Gabriel Facility include the following; however, the actual equipment may vary depending on the selected demolition contractor.

- 40-ton rubber-tired cranes
- Excavators with shear attachments
- Forklifts
- Pickup Truck
- Fuel/Lube truck
- Water Truck
- 10-wheeled dump trucks for transporting materials
- Truck tractor driven end-dumps for transporting wastes to appropriate disposal facilities
- Bulldozers
- Front-end loaders
- Backhoes

During peak demolition activities at the site, an estimated maximum of 25 tractor-trailer units will leave the site each day to transport waste and debris offsite for salvage, recycling or disposal.

2.3 Project Construction

Construction of PRP from initial engineering design and planning to commercial operation date is anticipated to require no more than 25 months. Demolition is expected to take no more than 3 months. Actual onsite physical construction from site preparation to completion of all mechanical, electrical, and balance of plant equipment is expected to take 16 months (see Table 4.10-6 in Section 4.10, Socioeconomics). The COD for PRP is scheduled for the first quarter of 2019. Major construction and commissioning milestones are shown in Table 2.3-1.

Table 2.3-1. PRP Major Milestones
Small Power Plant Exemption Application for the Pomona Repower Project

Activity	Period
Demolition of Existing Facilities	First half of 2017
Begin Construction of Power Block	Third Quarter 2017 to Fourth Quarter 2018
Commissioning	Fourth Quarter 2018 to First Quarter of 2019
Commercial Operation	First Quarter 2019

2.3.1 Construction Schedule and Workforce

The construction plan is based on a single 10-hour shift, 5 days per week. Overtime and additional shift work may be used to maintain or enhance the construction schedule. Construction will most typically take place between the hours of 6 a.m. and 6 p.m., Monday through Friday[4]; however, additional hours may be necessary to maintain schedule or to complete critical construction activities (such as large concrete pours). During the commissioning and startup phase of the power block, the schedule will be based on a single shift, 10 hours per day, 6 days per work week; however, during this time, some activities may continue 24 hours per day, 7 days per week.

An estimated peak of 142 craft and professional personnel is anticipated in the second quarter of 2018. Table 4.10-6, in the Socioeconomics section, provides the projected construction craft manpower by month.

2.3.2 Construction Plans

AltaGas will act as the general contractor for the engineering, procurement, and construction of the facility. Subcontractors will be selected by AltaGas.

2.3.2.1 Mobilization

The contractor will mobilize after full notice to proceed. Due to the existing site groundwork, grading and stormwater control will not be needed or will be included as part of construction. Some of the existing paved areas may require modification to account for underground piping and sumps. Because of existing paving, no site improvements will be needed prior to mobilization.

2.3.2.2 Construction Office Facilities

New temporary facility will be constructed for construction offices for owner, contractor, and subcontractor personnel. The construction of PRP will require offsite parking for construction workers. Construction workers will arrive at the offsite construction parking areas in private vehicles using various routes to the access the parking areas.

2.3.2.3 Construction Laydown and Storage

Offsite construction laydown and parking will be required. To the degree possible, adjacent property will be used for construction laydown (see Figure 2.3-1). Large equipment and components will be hauled from the construction laydown areas (or near-by rail spurs) to the PRP site on an as-needed basis.

Construction access will be from an access road connected to Mt. Vernon Avenue. Large or heavy equipment, such as the turbine, generator, and GSU transformer, may be delivered to the site by heavy haul truck/trailer following specific requirements of "heavy/oversize load" permits from appropriate agencies. Some large or heavy equipment may be transported to site via rail. In the event heavy equipment arrives but cannot be transferred directly into its final position at PRP, it will be placed in a designated laydown area or remain on the railcar until needed.

2.3.2.4 Emergency Facilities

Emergency services will be coordinated with the local fire agencies, the local Police Department, and local hospitals. An urgent care facility will be contacted to arrange for non-emergency physician referrals. First aid kits will be provided around the site and will be regularly maintained. At least one person trained in first aid will be part of the construction crew.

In addition, a Construction Safety Supervisor will be onsite. Construction foremen and supervisors will have first aid and CPR training, and will be trained in the use of a portable automatic external defibrillator, which will be available onsite at all times during construction.

Fire extinguishers will be located throughout the site at strategic locations at all times during construction.

[4] Although noisy construction is allowed Monday through Saturday from 7:00 a.m. to 8:00 p.m.

2.3.2.5 Construction Utilities

During construction, existing, onsite utility lines will be used to supply the construction offices, laydown area, and the project site.

Temporary construction power will be obtained from SCE. Area lighting will be provided and strategically located for safety and security.

Construction water will be supplied from the existing water supply system at the San Gabriel Facility. Average daily use of potable water is expected to be approximately 20,000 gallons. Hydrostatic test water and cleaning water will be tested and disposed in accordance with applicable LORS.

Portable toilets will be provided throughout the site.

2.3.2.6 Site Services

The following site services will be provided.

- Environmental health and safety training
- Site security
- Site first aid
- Construction testing (e.g., nondestructive examination, hydrostatic testing)
- Fire protection including extinguisher maintenance
- Furnishing and servicing of sanitary facilities
- Trash collection and disposal
- Disposal of hazardous materials and waste in accordance with local, state, and federal regulations

2.3.2.7 Construction Materials and Equipment

Construction equipment will be at the project site from shortly after demolition is completed through commissioning and startup. The type of equipment onsite will coincide with the work being performed. Materials such as concrete, pipe, wire and cable, fuels, reinforcing steel, and small tools and consumables will be delivered to the site by truck. Some of the heavy equipment items may be transported by rail. Site access will be controlled for personnel and vehicles.

There will be an average and peak workforce of approximately 52 and 142, respectively, of craft people, supervisory, support, and construction management personnel onsite during construction (see Table 4.10-6).

2.3.2.8 Construction Noise

Typically, noisy construction will be scheduled to occur between 7:00 a.m. and 8:00 p.m. Monday through Saturday. Additional construction hours may be necessary to make up schedule deficiencies or to complete critical construction activities (for example, pouring concrete at night during hot weather, working around time-critical shutdowns and constraints). During some construction periods and during the startup phase of the project, some activities will continue 24 hours per day, 7 days per week. See Section 4.7, Noise, for a discussion and analysis of construction noise.

2.3.2.9 Construction Lighting

Lighting will be required to facilitate PRP night construction and commissioning activities. Construction lighting will, to the extent feasible and consistent with worker safety codes, be directed toward the center of the construction site and shielded to prevent light from straying offsite. Task-specific construction/ commissioning lighting will be used to the extent practical while complying with worker safety regulations. Typically, construction will be scheduled to occur between 6:00 a.m. and 6:00 p.m., Monday through Friday. Additional hours may be necessary to make up schedule deficiencies or to complete critical construction activities (for example, pouring concrete at night during hot weather, working around time-critical shutdowns and constraints). During some construction periods and during the commissioning/ startup phase of the project, some activities will continue 24 hours per day, 7 days per week.

During periods when nighttime construction/commissioning activities take place, illumination that meets state and federal worker safety regulations will be required. To the extent possible, the nighttime construction/commissioning lighting will be erected pointing toward the center of the site where activities are occurring and will be shielded. Task-specific lighting will be used to the extent practical while complying with worker safety regulations. Despite these measures, there may be limited times during the construction/commissioning period when the project site may appear as a brightly lit area.

2.4 Facility Operations

PRP will be capable of being dispatched throughout the year and will have annual availability of 99 percent. It will be possible for plant availability to exceed 99 percent for a given 12-month period.

PRPs planned operations staff include retention of the same number of plant operators and supervisors. No new operations staff will be required. The facility will be capable of operating 24 hours per day, 7 days per week.

PRP will provide much needed flexible operating characteristics for integrating renewable energy into the electrical grid and providing fast response load following service, PRP is expected to have an annual capacity factor of between 20 and 43 percent. The exact operational profile of PRP will ultimately depend on electrical grid needs at the time and dispatch decisions made by the load serving entity contracted to buy and distribute the power generated and the California Independent System Operator (CAISO).

2.5 Engineering

This section, together with the engineering appendix (Appendix 2A), presents information concerning the design and engineering of PRP. The LORS applicable to engineering are provided in Appendix 2A.

Details on the following design criteria are included in Appendix 2A.

- Civil Engineering Design Criteria
- Structural Engineering Design Criteria
- Mechanical Engineering Design Criteria
- Electrical Engineering Design Criteria
- Control Engineering Design Criteria
- Chemical Engineering Design Criteria

Design and engineering information and data for the following systems are found in the following subsections of this SPPE Application.

- **Power Generation**—See Section 2.1.4, System Process; Section 2.1.5.1, Combustion Turbine Generator. Also see Appendix 2A and Sections 2.1.5 through 2.1.15, which describe the various plant auxiliaries.
- **Heat Dissipation**—See Section 2.1.9, Plant Cooling Systems and Appendix 2A.
- **Cooling Water Supply System**—See Section 2.1.9, Plant Cooling System, Section 2.1.10, Water Supply and Use, and Section 4.14, Water Resources.
- **Air Emission Control System**—See Section 2.1.11, Emission Control and Monitoring, and Section 4.1, Air Quality.
- **Waste Disposal System**—See Section 2.1.12, Waste Management, and Section 4.5, Hazardous Materials and Waste Management.
- **Noise Abatement System**—See Section 4.7, Noise.
- **Switchyards/Transformer Systems**—See Section 2.1.7, Major Electrical Equipment and Systems; Section 2.1.15.2, Grounding; Section 2.1.16, Interconnection to Electrical Grid; Section 3, Transmission System Engineering; and Appendix 2A.

2.5.1 Facility Safety Design

PRP will be designed to maximize safe operation. Potential hazards that could affect the facility include earthquake, flood, and fire. Facility operators will be trained in safe operation, maintenance, and emergency response procedures to minimize the risk of personal injury and damage to the plant.

2.5.2 Natural Hazards

The principal natural hazards associated with the PRP site are earthquakes and floods. The site is located in a seismically active area, as is most of southern California, and the potential for strong ground motion in the project area is considered significant during the design life of the proposed structures. Structures will be designed to meet the seismic requirements of Cal. Code Regs., Title 24, and the current California Building Code (CBC). Section 4.4, Geologic Resources and Hazards, discusses the geological hazards of the area and site, and includes a review of potential geologic hazards, seismic ground motions, and the potential for soil liquefaction caused by ground shaking. Appendix 2A includes the structural seismic design criteria for the buildings and equipment. According to the Federal Emergency Management Agency (FEMA), the site is not within the 100-year floodplain. Section 4.14, Water Resources, includes additional information on the potential for flooding.

2.5.3 Emergency Systems and Safety Precautions

This section discusses the fire protection systems, emergency medical services, and safety precautions to be used by project personnel. Section 4.10, Socioeconomics, includes additional information on area medical services, and Section 4.15, Worker Health and Safety, includes additional information on safety for workers. Compliance with these requirements will minimize project effects on public and employee safety.

2.5.3.1 Fire Protection Systems

The project will rely on onsite fire protection systems and local fire protection services. The fire protection systems are designed to protect personnel and limit property loss and plant downtime from fire or explosion. The project will have the following fire protection systems.

Carbon Dioxide and Dry Chemical Fire Protection Systems. These systems protect the CTG and certain accessory equipment compartments from fire. The system will have fire detection sensors in all protected compartments. Actuating one sensor will provide a high-temperature alarm on the CTG control panel. Actuating a second sensor will trip the CTG, turn off ventilation, close ventilation openings, and automatically release the gas and chemical agents. The gas and chemical agents will be discharged at a design concentration adequate to extinguish the fire.

Sprinkler and Deluge Systems. These systems protect buildings, large transformers, and specific electrical equipment rooms. Buildings will generally be protected by automatic wet-type sprinkler systems. Large transformers (GSU and auxiliary transformers) will be protected by automatic water spray (deluge) systems. Electrical equipment and battery rooms will be protected with pre-action sprinkler systems.

Fire Hydrants/Hose Stations. This system will supplement the plant's fixed fire suppression systems. Water will be supplied from the plant fire water system.

Fire Extinguisher. The plant administrative/control/warehouse/maintenance building, water treatment building, and other structures will be equipped with portable fire extinguishers as required by the local fire department.

Local Fire Protection Services. In the event of a major fire, the plant personnel will be able to call upon the local fire department for assistance. A Hazardous Materials Business Plan (HMBP) for the plant will be filed with the Los Angeles County Fire Department (LACFD). It will include all information necessary to allow firefighting and other emergency response agencies to plan and implement safe responses to fires, spills, and other emergencies. (See Section 4.5 for further discussion.)

2.5.3.2 Personnel Safety Program

PRP will operate in compliance with federal and state occupational safety and health program requirements. Compliance with these programs will minimize project effects on employee safety. These programs are described in Section 4.15, Worker Health and Safety.

2.6 Facility Reliability

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

2.6.1 Facility Availability

PRP is designed to operate between approximately 25 and 100 percent of base load to support dispatch service in response to customer demands for electricity. PRP is designed for an 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 useful life status of plant components.

The percent of time that a 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 block, 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 EAF for PRP is estimated to be approximately 99 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.

2.6.2 Redundancy of Critical Components

The following subsections identify equipment redundancy as it applies to PRP availability. Specifically, redundancy in the power block and in the balance-of-plant systems that serve it. The power block will be served by the following balance-of-plant systems: fuel supply system, DCS, demineralized water system, closed-loop cooling water system, and compressed air system. Major equipment redundancy is summarized in Table 2.6-1.

Table 2.6-1. Major Equipment Redundancy
Small Power Plant Exemption Application for the Pomona Repower Project

Description	Number Per Power Block	Note
LMS100 Combustion Turbine	1 – 100%	The LMS100 is equipped with an evaporative air cooler to maintain performance at high ambient temperatures
Cooling Tower	1 – 100%	The cooling tower will be multi-fan and designed to operate at 100 percent capacity with one fan out of service
Closed-loop Cooling Heat Exchanger	2 – 100%	Each heat exchanger will provide complete plant cooling
Air Compressors	2 – 100%	—
Fuel Gas Compressors	2 – 100%	—

2.6.2.1 Power Block

PRP consists of one CTG power generation train.

2.6.2.2 CTG Subsystems

The PRP CTG subsystems will include the combustion turbine, inlet air filtration, cooling/heating system, turbine and generator lubrication oil systems, starting system, fuel system, generator and excitation systems, and turbine control and instrumentation. The combustion turbine will produce thermal energy through the combustion of natural gas. The thermal energy will be converted into mechanical energy through rotation of the combustion turbine, which drives the compressor and generator. The generator excitation system will be a solid-state static system. Combustion turbine control and instrumentation (interfaced with the DCS) will cover the turbine governing system, the protective system, and the sequence logic.

2.6.2.3 Plant Distributed Control System

The PRP DCS will be a redundant microprocessor-based system and will have a functionally distributed architecture comprising a group of similar redundant processing units; these units will be linked to a group of operator consoles and an engineer work station by redundant data highways. Each processor will be programmed to perform specific dedicated tasks for control information, data acquisition, annunciation, and historical purposes. Because they will be redundant, no single processor failure can cause or prevent a unit trip.

The DCS will interface with the control systems furnished by the CTG and fuel gas compressor suppliers to provide remote control capabilities, as well as data acquisition, annunciation, and historical storage of turbine and generator operating information.

The system will be designed with enough redundancy to preclude a single device failure from significantly affecting overall plant control and operation. Consideration will be given to the action performed by the control and safety devices in the event of control circuit failure. Controls and controlled devices will move to the safest operating condition upon failure.

Plant operation will be controlled from the operator panel in the control room. The operator panel will consist of three individual CRT/keyboard consoles, one engineering workstation, and one historian workstation. Each CRT/keyboard console will be an independent electronic package so that failure of a single package will not disable more than one CRT/keyboard. The engineering workstation will allow the control system operator interface to be revised by authorized personnel.

2.6.2.4 Makeup Water Treatment System

Recycled water will be used as plant makeup and will be treated by two, 100-percent-capacity trains of two-pass reverse osmosis equipment followed by an electro-deionization system with two 100-percent-capacity trains.

2.6.2.5 Water Makeup and Storage

The makeup and storage subsystem provides demineralized water storage and pumping capabilities to supply high-purity water for evaporative cooler makeup, turbine water injection, CTG water wash, and chemical cleaning operations. The major components of the system include a single demineralized water storage tank and two, 100-percent-capacity, horizontal, centrifugal, cycle makeup water pumps.

2.6.2.6 Compressed Air System

The compressed air system will be designed to supply service and instrument air for the facility. Dry, oil-free instrument air will be provided for pneumatic operators and devices throughout the plant. Compressed service air will be provided to appropriate areas of the plant as utility stations consisting of a ball valve and quick disconnect fittings.

The instrument air system will be given demand priority over the service air system. A backpressure control valve will cut off the air supply to the service air header so as to maintain the minimum required instrument air pressure.

Two, 100-percent-capacity, oil free, rotary screw package air compressors will supply compressed air to the service and instrument air systems. Two, 100-percent-capacity, heat-less desiccant air dyers will be provided to dry the service and instrument air.

2.6.3 Fuel Availability

Fuel will be delivered via an existing 300 psi natural gas main located on west side of the project site. The system has sufficient capacity to supply PRP at this location.

2.6.4 Water Availability

PRP will use, on average, 171 afy of recycled water for power plant cooling and process water and fire protection. Potable water will be used for building services along with emergency showers and eyewash stations. To further reduce potable water use, low-flow toilets and waterless urinals will be used.

The availability of water to meet the needs of PRP is discussed in more detail in Section 4.14, Water Resources.

2.6.5 Sewer and Wastewater Treatment Availability

PRP will discharge, on average, 37.5 afy of process wastewater. The process wastewater will be sent to the existing wastewater discharge point that returns the wastewater to the Sanitation Districts of Los Angeles County (LACSD).

2.6.6 Project Quality Control

The PRP quality control program is summarized in this subsection. The objective of the quality control program is to ensure that all systems and components have the appropriate quality measures applied, whether during design, procurement, fabrication, construction, or operation. The goal of the quality control program is to achieve the desired levels of safety, reliability, availability, operability, constructability, and maintainability for generating electricity.

The required quality assurance for a system is obtained by applying controls to various activities, according to the activity being performed. For example, the appropriate controls for design work are checking and review, and the appropriate controls for manufacturing and construction are inspection and testing. Appropriate controls will be applied to each of the various activities for the project.

2.6.6.1 Project Stages

For quality assurance planning purposes, PRP activities have been divided into the following stages that apply to specific periods during the project:

- **Conceptual Design Criteria.** Activities such as definition of requirements and engineering analyses.
- **Detail Design.** Activities such as the preparation of calculations, drawings, and lists needed to describe, illustrate, or define systems, structures, or components.
- **Procurement Specification Preparation.** Activities necessary to compile and document the contractual, technical, and quality provisions for procurement specifications for plant systems, components, or services.
- **Manufacturer’s Control and Surveillance.** Activities necessary to ensure that the manufacturers conform to the provisions of the procurement specifications.

- **Manufacturer Data Review.** Activities required to review manufacturers' drawings, data, instructions, procedures, plans, and other documents to ensure coordination of plant systems and components, and conformance to procurement specifications.
- **Receipt Inspection.** Inspection and review of product at the time of delivery to the construction site.
- **Construction/Installation.** Inspection and review of storage, installation, cleaning, and initial testing of systems or components at the facility.
- **System/Component Testing.** Actual operation of generating facility components in a system in a controlled manner to ensure that the performance of systems and components conform to specified requirements.
- **Plant Operation.** As the project progresses, the design, procurement, fabrication, erection, and checkout of each generating facility system will progress through the stages defined above.

2.6.6.2 Quality Control Records

The following quality control records will be maintained for review and reference:

- Project instructions manual
- Design calculations
- Project design manual
- Quality assurance audit reports
- Conformance to construction records drawings
- Procurement specifications (contract issue and change orders)
- Purchase orders and change orders
- Project correspondence

For procured component purchase orders, a list of qualified suppliers and subcontractors will be developed. Before contracts are awarded, the subcontractors' capabilities will be evaluated. The evaluation will consider suppliers' and subcontractors' personnel, production capability, past performance, and quality assurance program.

During construction, field activities are accomplished during the last four stages of the project: receipt inspection, construction/installation, system/component testing, and plant operations. The construction contractor will be contractually responsible for performing the work in accordance with the quality requirements specified by the contract.

The subcontractors' quality compliance will be surveyed through inspections, audits, and administration of independent testing contracts.

A plant operation and maintenance program, typical of a project this size, will be implemented by PRP to control operation and maintenance quality. A specific program for this project will be defined and implemented during initial plant startup.

2.7 Thermal Efficiency

The thermal efficiency that can be expected from the configuration specified for PRP is approximately 43 percent based on LHV, gross output at terminals, base load operation, and ISO conditions. Other types of operations, particularly those at less than full gas turbine output, will result in lower efficiencies. However, the PRP design achieves a very high level of efficiency across a wide range of generating capacity. The basis of PRP operations will be system dispatch within California's power generation and transmission system. It is expected that PRP will be primarily operated in peaking service. The number of startup and shutdown cycles is expected to range between 200 and 500 per year.

Plant fuel consumption will depend on the operating profile of the power plant. It is estimated that the range of fuel consumed by the power plant will be from a minimum of near zero BTUs per hour to a maximum of approximately 866 MMBtu/hr (LHV basis) at minimum ambient conditions.[5]

The net annual electrical production of PRP cannot be accurately forecasted at this time because of uncertainties in the system load dispatching model and the associated uncertainties in load forecasts. However, because of the efficiency of the plant with operating characteristics as described above, it is expected to have a gross plant capacity factor between 20 and 43 percent. The maximum annual generation from the facility is estimated to be approximately 358 gigawatt hours per year. This annual output is based on 3,800 hours of LMS100 operation at base load.

2.8 Facility Closure

Facility closure can be temporary or permanent. Temporary closure is defined as a shutdown for a period exceeding the time required for normal maintenance, including closure for overhaul or replacement of the CTG. Causes for temporary closure include a disruption in the supply of natural gas or damage to the plant from earthquake, fire, storm, or other natural acts. Permanent closure is defined as a cessation in operations with no intent to restart operations because of plant age, damage to the plant beyond repair, economic conditions, or other reasons. The following sections discuss temporary and permanent facility closure.

2.8.1 Temporary Closure

For a temporary facility closure, where there is no release of hazardous materials, security of the facilities will be maintained on a 24-hour basis, and the CEC and other responsible agencies will be notified. Depending on the length of shutdown necessary, a contingency plan for the temporary cessation of operations will be implemented. The contingency plan will be conducted to ensure conformance with all applicable LORS and the protection of public health, safety, and the environment. The plan, depending on the expected duration of the shutdown, may include the draining of all chemicals from storage tanks and other equipment and the safe shutdown of all equipment. All wastes will be disposed of according to applicable LORS, as discussed in Section 4.5.

Where the temporary closure includes damage to the facility, and there is a release or threatened release of regulated substances or other hazardous materials into the environment, procedures will be followed as set forth in a Risk Management Plan (RMP) and a HMBP to be developed, as described in Section 4.5. Procedures will include methods to control releases, notification of applicable authorities and the public, emergency response, and training for plant personnel in responding to and controlling releases of hazardous materials. Once the immediate problem is solved, and the regulated substance/hazardous material release is contained and cleaned up, temporary closure will proceed as described above for a closure where there is no release of hazardous materials.

2.8.2 Permanent Closure

The planned life of PRP is 30 years. However, if the plant is still economically viable, it could be operated longer. It is also possible that the facility could become economically noncompetitive in less than 30 years, forcing early decommissioning. Whenever the facility is permanently closed, the closure procedure will follow a plan that will be developed as described below.

The removal of the facility from service, or decommissioning, may range from “mothballing” to the removal of all equipment and appurtenant facilities, depending on conditions at the time. Because the conditions that would affect the decommissioning decision are largely unknown at this time, these

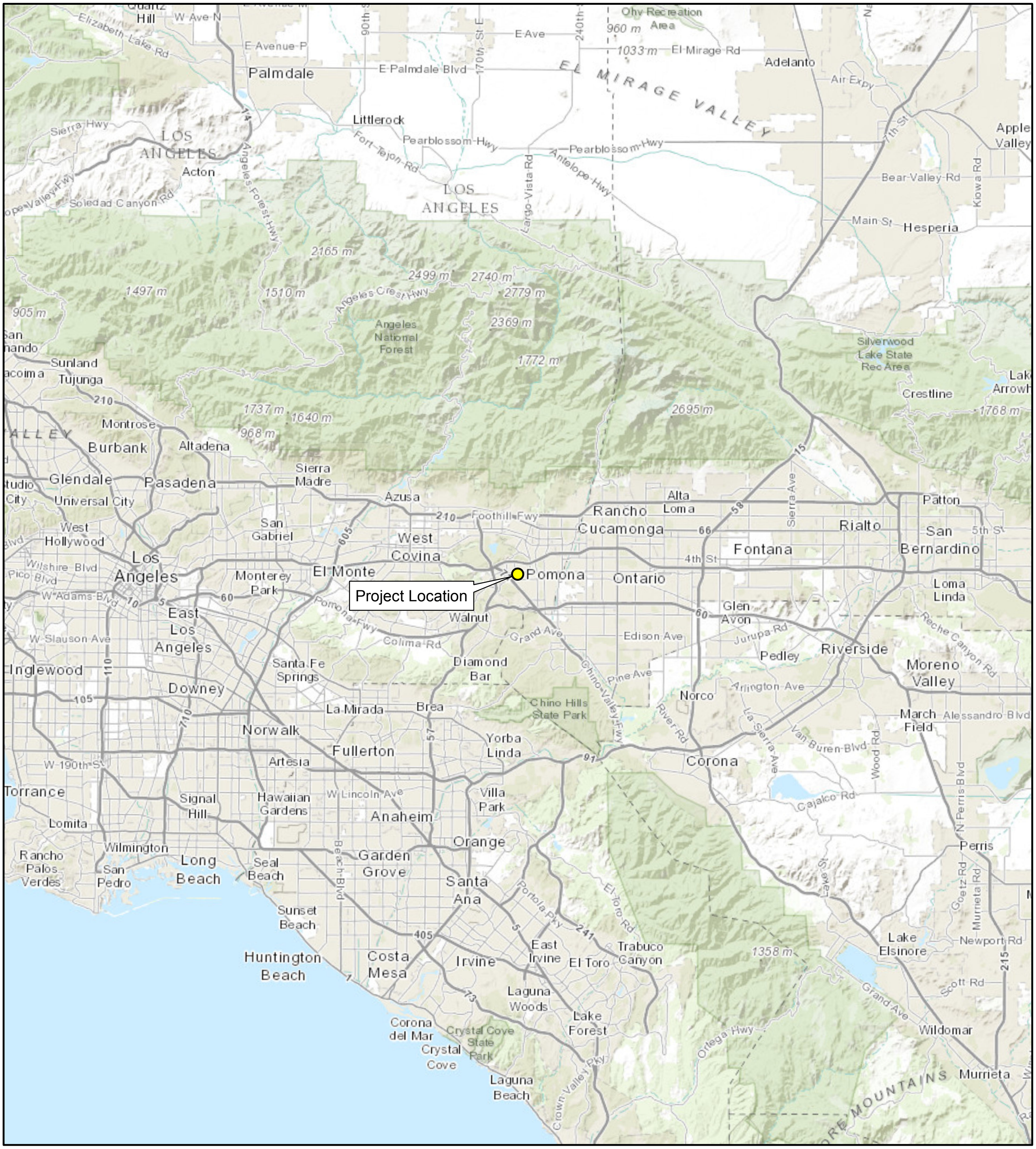
[5] Minimum ambient condition is 28°F, full load, 60 percent relative humidity.

conditions would be presented to the CEC when more information is available and the timing for decommissioning is more imminent.

To ensure that public health and safety and the environment are protected during decommissioning, a decommissioning plan would be submitted to the CEC for approval prior to decommissioning. The plan would address the following:

- Proposed decommissioning activities for the facility and all appurtenant facilities constructed as part of the facility
- Conformance of the proposed decommissioning activities to all applicable LORS and local/regional plans
- Activities necessary to restore the site if the plan requires removal of all equipment and appurtenant facilities
- Decommissioning alternatives other than complete restoration
- Associated costs of the proposed decommissioning and the source of funds to pay for the decommissioning

In general, the decommissioning plan for the facility will attempt to maximize the recycling of all facility components. If possible, unused chemicals will be sold back to the suppliers or other purchasers or users. All equipment containing chemicals will be drained and shut down to ensure public health and safety and to protect the environment. All nonhazardous wastes will be collected and disposed of in appropriate landfills or waste collection facilities. All hazardous wastes will be disposed of according to all applicable LORS. The site will be secured 24 hours per day during decommissioning activities.



LEGEND

Project Location

N

0 10
Miles
1:633,600

FIGURE 2-1

Project Vicinity
Pomona Repower Project
Pomona, California

Source Information: Esri Topo Map (Accessed December 2015)

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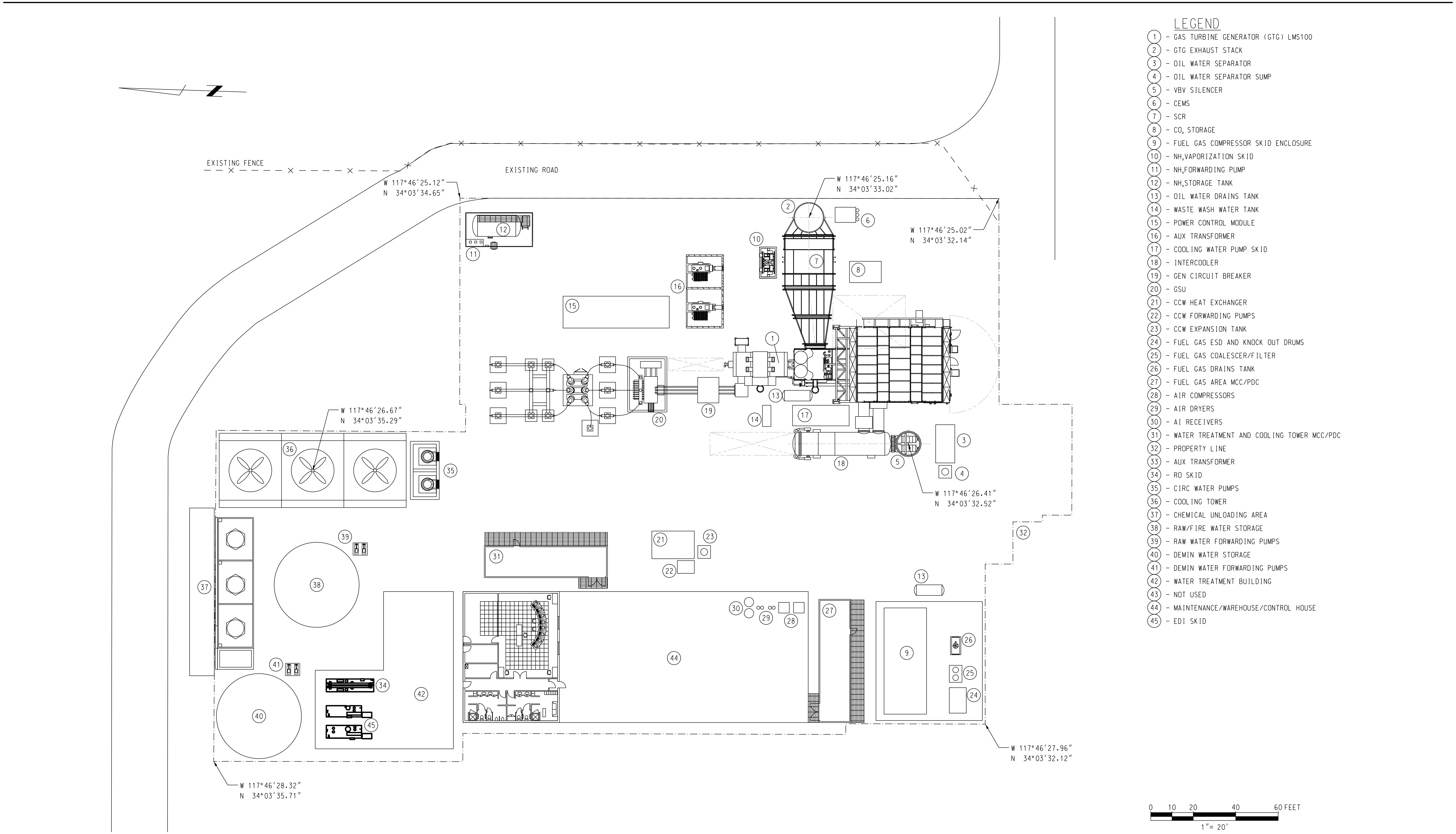
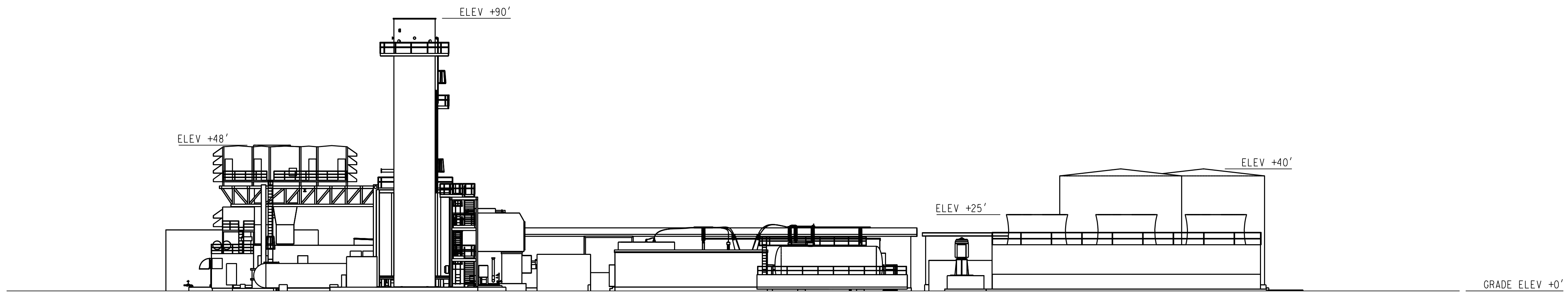


Source: Power Engineers, Drawing MSK1-1, Rev. C., 2/16/16.

FIGURE 2.1-1
Site Plan and General Arrangement
Pomona Repower Project
Pomona, California

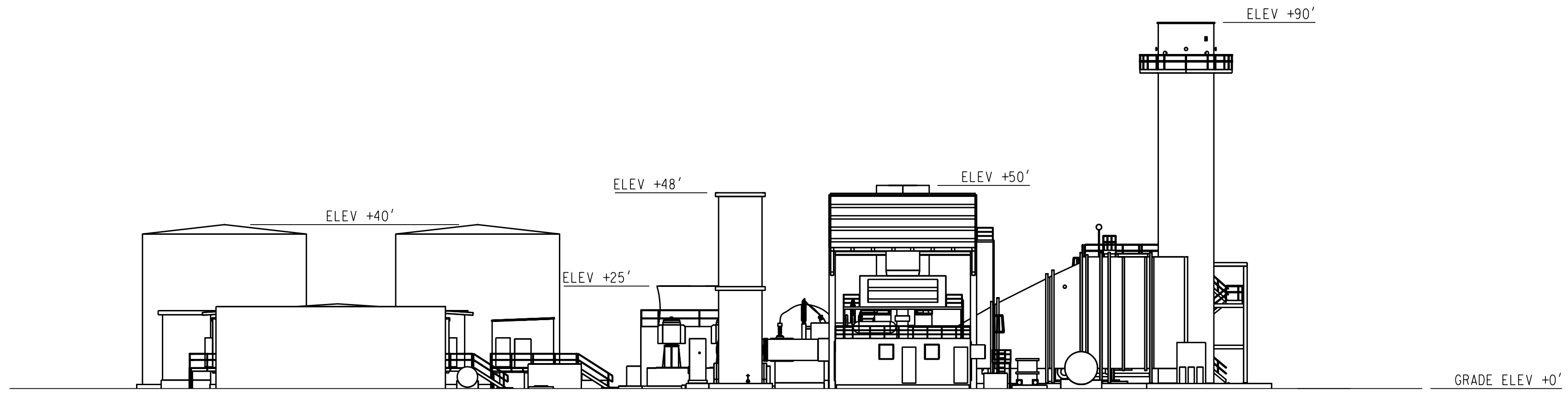


ELEVATION LOOKING WEST

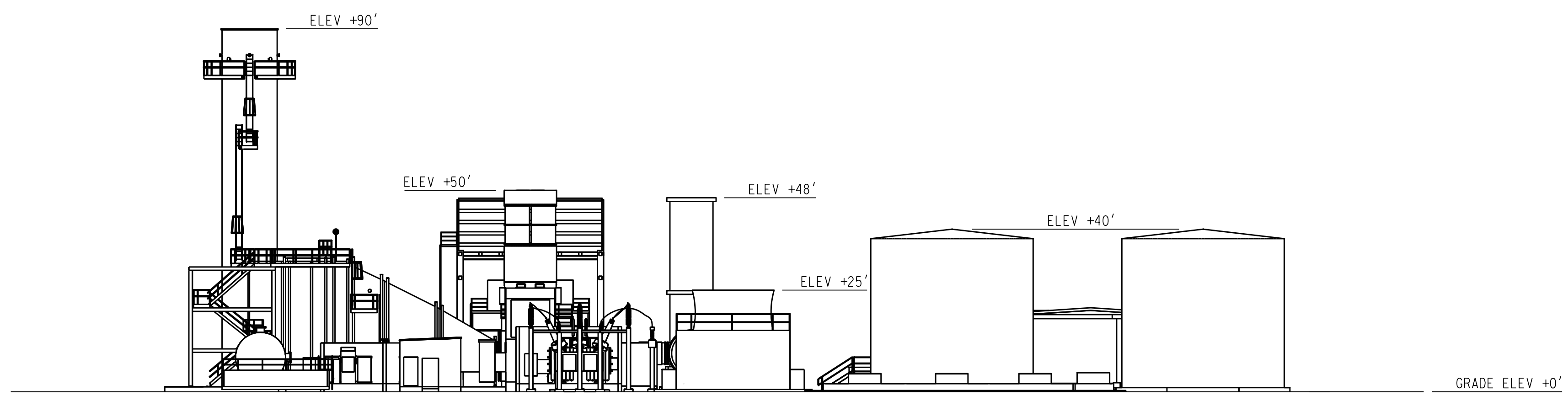
ELEVATION LOOKING EAST

FIGURE2.1-2a
West/East Elevation View
Pomona Repower Project *Pomona, California*

Source: Power Engineers, Drawing MSK1-3, Rev. A., 7/10/15.



ELEVATION LOOKING NORTH



ELEVATION LOOKING SOUTH

0 10 20 40 60 FEET
1"= 20'

FIGURE2.1-2b
North/South Elevation View
Pomona Repower Project *Pomona, California*

Source: Power Engineers, Drawing MSK1-2, Rev. A., 7/10/15.

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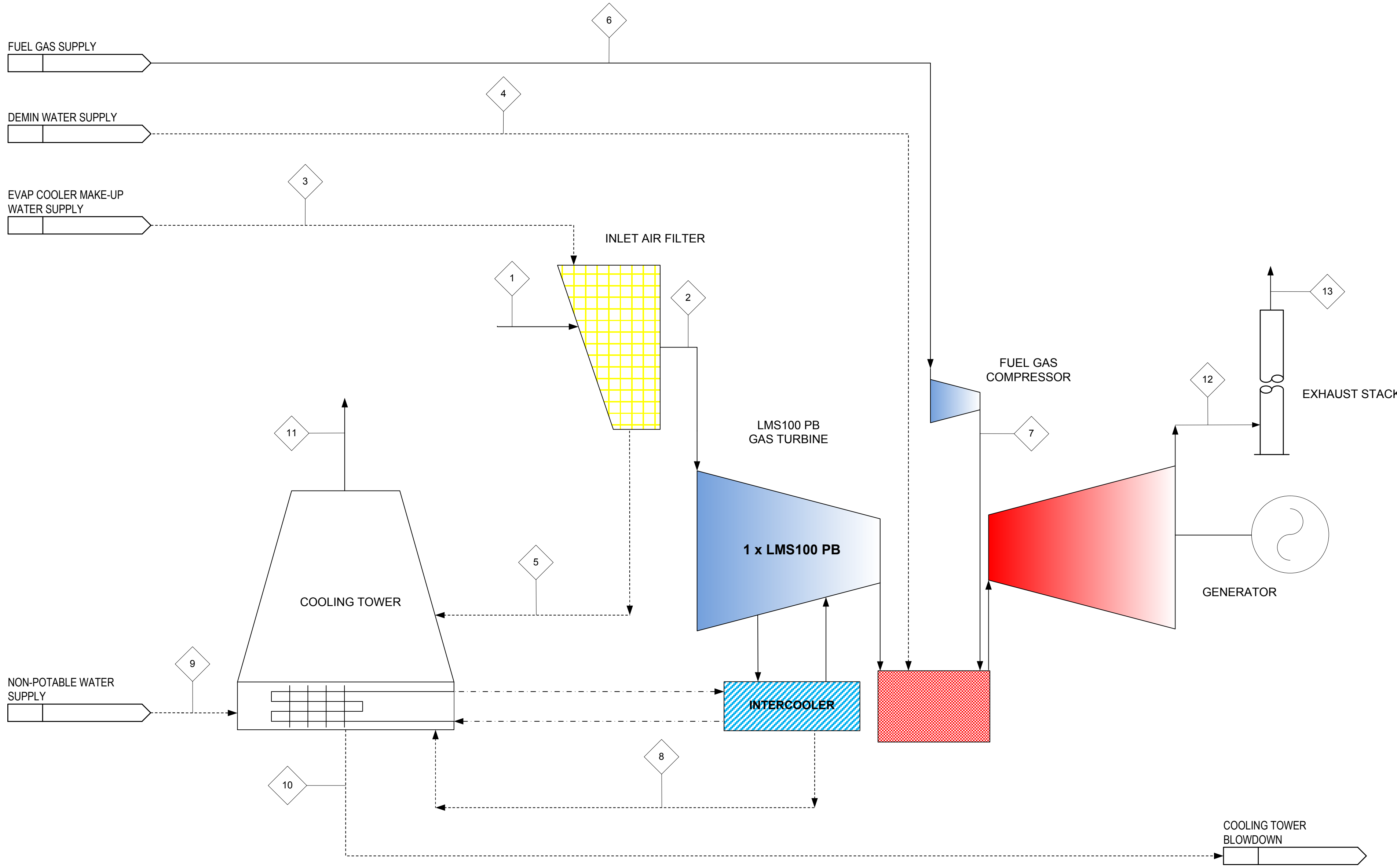


PLANT PERFORMANCE SUMMARY		
DESCRIPTION	CASE 1	CASE 2
LMS100 GAS TURBINE GROSS OUTPUT, KW	106,761	100,790
ESTIMATED PLANT AUXILIARY POWER, KW	3,203	3,024
PLANT NET OUTPUT, KW	103,558	97,766
FUEL INPUT LMS100, MMBTU/HR (LHV)	842.0	806.0
FUEL INPUT LMS100, MMBTU/HR (HHV)	932.9	893.0
PLANT NET HEAT RATE, BTU/KWH (LHV)	8,131	8,244
PLANT NET HEAT RATE, BTU/KWH (HHV)	9,009	9,135
PLANT THERMAL EFFICIENCY, % (LHV)	41.96%	41.39%

NOTES:

1. ALL FLOWRATES ARE SHOWN FOR ONE LMS100 PA AT 100% LOAD
2. FIVE5 (5) CYCLES OF CONCENTRATION ARE ASSUMED FOR EVAPORATIVE COOLER AND COOLING TOWER
3. GAS TURBINE INFORMATION WAS PROVIDED BY GE
4. SITE ELEVATION 850 FT
5. EVAPORATIVE COOLER EFFECTIVENESS = 85%
6. GENERATOR @ 13.8 kV, 0.9 PF

STREAM NUMBER				1	2	3	4	5	6	7	8	9	10	11	12	13
DESCRIPTION				LMS100 Air Entering Evap Cooler	LMS100 Air Entering Gas Turbine	LMS100 Evap Cooler Make Up	LMS100 Water Injection	LMS100 Evap Cooler Blowdown	LMS100 Fuel Gas to Compressor	LMS100 Fuel Gas to Gas Turbine	LMS100 Intercooler Drains	Cooling Tower Make up	Cooling Tower Blowdown	Cooling Tower Evaporation and Drift	LMS100 Exhaust Gas	LMS100 Exhaust Gas at Stack Exit
CASE:	LOAD:	PARAMETER:	UNIT:													
CASE 1 74° F 31% RH	100% GTG LOAD EVAP: ON	PRESSURE	PSIA	14.25	14.07	-	-	-	250.00	919.20	-	-	-	-	14.47	14.25
		TEMPERATURE	° F	74.00	59.50	59.00	59.00	59.50	77.00	246.00	100.00	59.00	66.00	74.00	784.80	784.80
		ENTHALPY	BTU/LBM	-	-	-	-	-	20,729.00	20,729.00	-	-	-	-	-	-
		TOTAL FLOW	KPPH	1,680.00	1,686.35	7.95	23.69	1.60	41.73	41.73	2.80	124.70	25.80	103.30	1,748.98	1,748.98
CASE 2 99.8 ° F 22% RH	100% GTG LOAD EVAP: ON	PRESSURE	PSIA	14.25	14.07	-	-	-	250.00	919.20	-	-	-	-	14.47	14.25
		TEMPERATURE	° F	99.80	76.00	59.00	59.00	76.00	77.00	246.00	100.00	59.00	66.00	99.80	803.80	803.80
		ENTHALPY	BTU/LBM	-	-	-	-	-	20,729.00	20,729.00	-	-	-	-	-	-
		TOTAL FLOW	KPPH	1,610.25	1,620.50	12.80	21.82	2.55	39.90	39.90	11.90	122.90	27.45	109.90	1,670.32	1,670.32

LINE LEGEND

WATER, CONDENSATE, WASTE WATER

AIR, EXHAUST, GASES

CLOSED COOLING WATER

FIGURE 2.1-3
Heat Balance

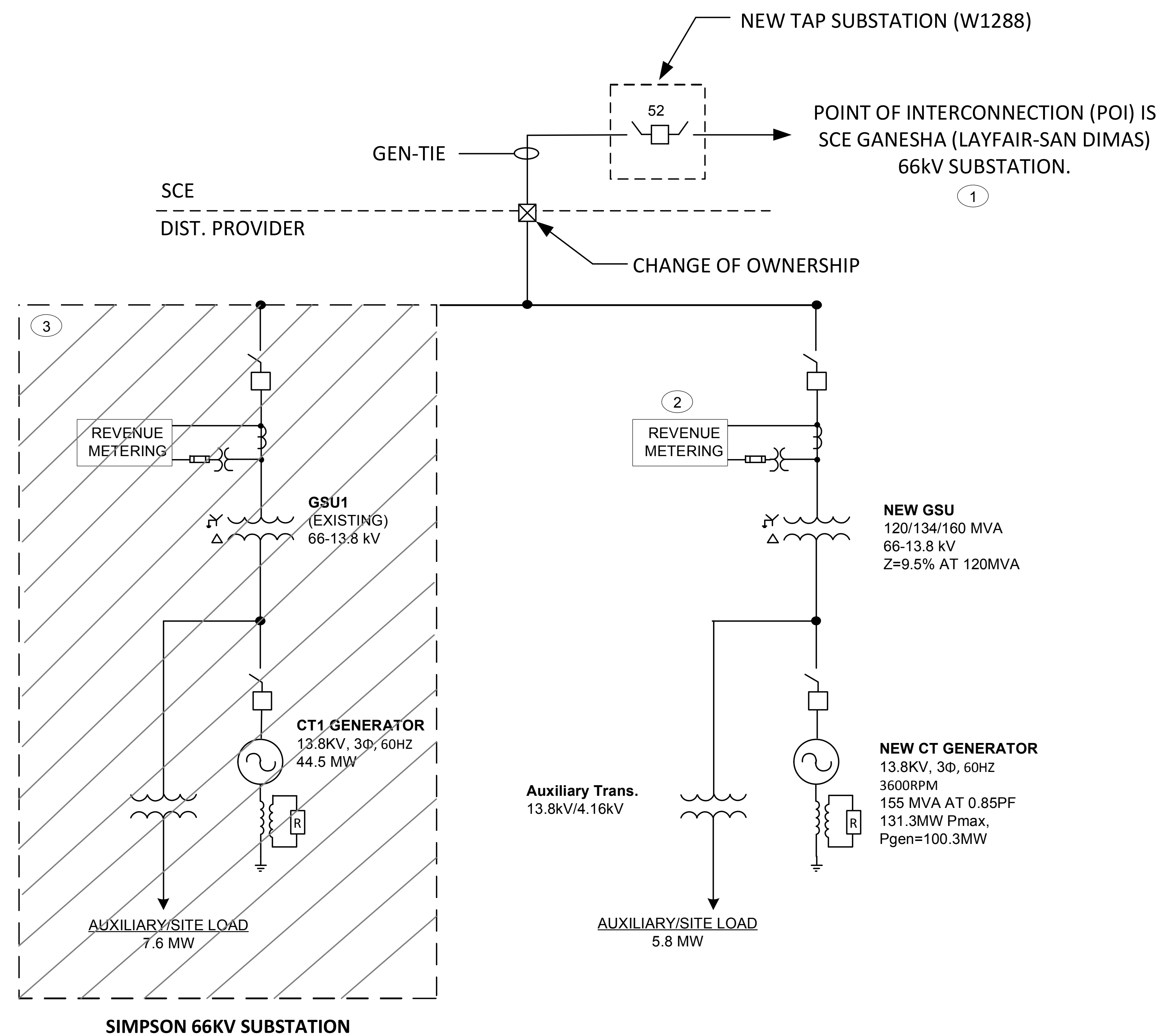
Pomona Repower Project
Pomona, California

Source: Power Engineers, Drawing MSK2-1, Rev. B., 10/16/15.

ONE-LINE DIAGRAM NOTES

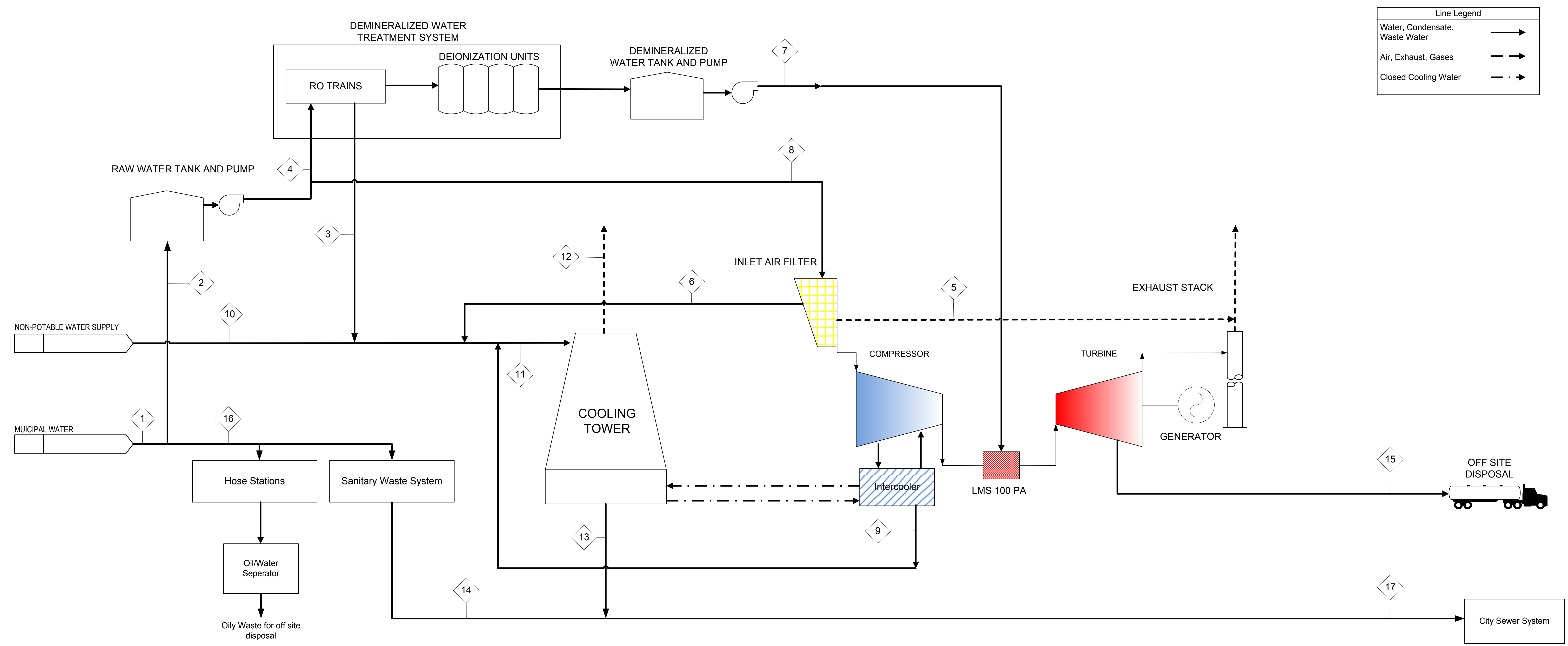
1. POINT OF INTERCONNECTION, 50MW EXPANSION 94.5 NET TO GRID.
2. REVENUE METER MAXIMUM LOAD 827A AT 94.5M
3. EXISTING SAN GABRIEL COGEN FACILITY TO BE REMOVED

PROJECT SUMMARY	
QTY.	EQUIPMENT
1	LMS-100
1	GENERATOR STEP UP XFMRS (GSU)



Source: ZGlobal, Simplified One-Line Diagram, Rev. C., 3/31/15.

FIGURE 2.1-4
One-line Diagram of Electrical System
Pomona Repower Project
Pomona, California



Stream Number		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Description	Units	Total Potable Water	Raw Water Make-up	RO Reject	RO Feed	Evaporated Water	Evap Cooler Blowdown	Turbine Water Injection	Evap Cooler Make-up	Intercooler Condensation	Non-Potable CT Make-up	Total CT Make-up	CT Evaporation and Drift	Cooling Tower Blowdown	Sanitary Waste	Turbine Wash Water Waste	Mucipal Water Supply	Discharge to City Sewer
Water Source		Potable	Potable	Potable	Potable	Potable	Potable	Potable	Potable	Condensation	Reclaimed	Reclaimed	Reclaimed	Reclaimed	Potable	Potable	Potable	Reclaimed
Avg. Flow 74F 31%RH	GPM	70.6	68.6	5.3	52.7	12.7	3.2	47.4	15.9	5.6	244.1	258.2	206.6	51.6	2	0	2	53.6
Avg. Flow 99.8F 22%RH	GPM	76.0	74.0	4.8	48.4	20.5	5.1	43.6	25.6	23.8	241.0	274.7	219.8	54.9	2	0	2	56.9

NOTES:

1. All cases show one LMS100 PA in operation at 100% load
2. Incoming water is assumed to be filtered, non-potable (Title 22)
3. Five (5) cycles of concentration are assumed for cooling tower and evap cooler

Source: Power Engineers, Drawing MSK2-2, Rev. C., 02/17/16.

FIGURE 2.1-5
Water Balance Diagram
Pomona Repower Project
Pomona, California

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Legend

- Site Boundary
- Proposed Construction Parking and Laydown Area
- Proposed Rail Spurs

N

0 150 Feet

FIGURE 2.3-1
Proposed Construction Parking and Laydown Areas
Pomona Repower Project
Pomona, California

Source: Esri World Imagery (Accessed 2016-03-15)

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