CHAPTER 1

INTRODUCTION

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Introduction

Southern California Edison Company (SCE) proposes to build a new small electricity generating unit commonly referred to as a "peaker" that will be capable of producing up to 45 net Megawatts (MW) of electricity. The unit will be operated primarily during periods of peak power demand when the electrical grid system needs additional usable electric power capacity or when local voltage support[1] is required. The unit can be started on short notice to respond to demand peaks.

The project facilities will include one natural gas-fired General Electric (GE) LM6000 gas turbine generator, pollution control equipment including a selective catalytic reduction (SCR) and, oxidation catalyst, an 80-foot tall exhaust stack, a 10,500-gallon 19 percent aqueous ammonia storage tank, fuel gas supply line, fuel gas compressor, water supply line, water demineralizer, water storage tanks, transformers, 66 kilovolt (kV) transmission tap line, a natural gas-fired black-start generator[2], and a power control module.

Regulatory Authority

California Environmental Quality Act

The California Environmental Quality Act (CEQA), Public Resources Code §21000 et seq., requires that the potential environmental impacts of proposed projects, initiated by, funded by, or requiring discretionary approvals from State or local government agencies, be evaluated and that feasible methods to reduce or avoid identified significant adverse environmental impacts of these projects be identified.

The proposed peaker plant project constitutes a "project" as defined by CEQA (California Public Resources Code §§21000 et seq.). To fulfill the purpose and intent of CEQA, the SCAQMD has prepared this Initial Study (IS) to address the potential environmental impacts associated with this proposed project. Prior to making a decision on the proposed project, the SCAQMD's decision makers must review and certify the IS as providing adequate information on the potential adverse environmental impacts of the proposed project.

Lead Agency Authority

The California Public Utilities Commission (CPUC) has issued rules relating to the planning and construction of electric generation, transmission/power/distribution line facilities and substations in California. These rules, detailed in General Order No. 131-D (GO 131-D), specify CEQA requirements associated with the issuance of permits for electrical facilities, including:

- GO 131-D Section IXV states that, "for all issues relating to the siting, design and construction of electric generating plant or transmission lines…the Commission will be the Lead Agency under CEQA, unless a different designation has been negotiated between the Commission and another state agency consistent with CEQA guidelines."

1 Voltage support is the term used in the power industry to mean power provided to the electrical distribution grid to maintain voltages within the acceptable range.
2 Black start generator is an industry term that refers to the start up during power outages, or when the electrical grid is "black". Please see process description below for more information on this piece of equipment.

- GO 131-D Section XIV states that, "local jurisdictions acting pursuant to local authority are preempted from regulation electric…facilities constructed by public utilities subject to the Commission's jurisdiction."

While the CPUC has overall authority pursuant to CEQA to regulate electric facilities such as the proposed peaker unit, the Commission does not require any discretionary permit for electric generating projects smaller than 50 MW. Local agencies may still require approvals for the proposed project and other State agencies may also exert jurisdiction in specific resource areas.

Where more than one public agency has authority over a project, CEQA requires one of these agencies to serve as the "lead agency." The lead agency is the public agency that has the principal responsibility for carrying out or approving a project that may have a significant effect upon the environment (Public Resources Code §21067). The proposed project requires discretionary approval from the SCAQMD and, since the SCAQMD has the greatest responsibility for supervising or approving the project as a whole, it was determined that the SCAQMD would be the most appropriate public agency to act as lead agency (CEQA Guidelines §15051(b)).

Basis for the Decision to Prepare Initial Study/Mitigated Negative Declaration

To fulfill the purpose and intent of CEQA, the SCAQMD has prepared the Initial Study/Mitigated Negative Declaration (IS/MND) for the proposed project. A IS/MND is the appropriate document when an initial study identifies potentially significant effects, but (1) revisions in the project plans or proposals made by, or agreed to by the applicant before a proposed mitigated negative declaration and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur, and (2) there is no substantial evidence that the proposed project as revised may have a significant effect on the environment (CEQA Guidelines §15070(b)). Based on this conclusions of this IS, the IS/MND is the appropriate document because although the initial study identifies potentially significant effects, the project plans made by, and agreed to by the applicant before a proposed mitigated negative declaration and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur.

Required Permits

The proposed project will require a Permit to Construct and Permit to Operate from the SCAQMD. The project may require one or more building permits.

Project Location

The proposed equipment will be installed at 8662 Cerritos Avenue, on property owned by SCE, in the City of Stanton, California. The proposed project site is located on the southwest corner of the existing Barre Substation property. The Barre substation is bordered to the north by Cerritos Avenue, to the west by Dale Avenue, and to the south and east by residential land uses at the property line. Land use along Cerritos Avenue in the project vicinity includes low- and high-density residential and the Robert M. Pyles Elementary School which is located on the corner of Cerritos Avenue and Dale Avenue. Land use along Dale Avenue is a mix of residential and small commercial. The existing substation contains the transmission and distribution equipment needed to reduce the voltage of electricity from the 220 kV (220,000 volts or 220 kilovolts) used

by the high voltage transmission system to the 66 kV used by the local distribution system. This equipment includes capacitors, breakers, transformers, switches, high voltage buses, and transmission poles. A transmission operations building is also present.

The project's electrical interconnection to the electricity grid will be made onsite at the existing SCE Barre Substation. Project facilities will be located within an area approximately 220 feet by 320 feet in size. A site location map and aerial photograph of the facility are provided as **Figures 1** and **2,** respectively. Subsequent to release of the Draft MND for public review and comment, SCE determined that it is necessary to modify the proposed site configuration from the configuration in the Draft MND by rotating the proposed site by 17 degrees clockwise around the exhaust stack. The modified proposed site configuration is shown in **Figure 2**.

Project Background

On August 15, 2006, the California Public Utilities Commission (CPUC) issued an Assigned Commissioner's Ruling (ACR) addressing electric reliability needs in southern California for summer 2007. Commissioner Michael Peevey stated:

> "In light of recent events, I find it is necessary to take additional action. The heat storm that hit California in July 2006, and the surprising growth in electricity demand throughout the state that become evident even before the heat storm, have exposed certain vulnerabilities in the electric generation and transmission infrastructure that require immediate attention to assure reliability in 2007, particularly in parts of southern California. Accordingly … I direct Southern California Edison Company (SCE) to expand its Air Conditioning Cycling Program … to target an additional 300 megawatts (MW) of program capacity for the summer 2007 season. In addition, SCE should pursue the development and installation of up to 250 MW of black-start, dispatchable generation capacity within its service territory for summer 2007 operation."

Project Schedule

To comply with the CPUC's ruling, SCE plans to construct the proposed peaker plant in time to serve SCE customers by July 1, 2007. Because project construction will require three to four months, to achieve this goal, SCE must obtain the Permit to Construct from the SCAQMD and comply with the requirements of the CEQA expeditiously so that construction can begin by March 1, 2007.

Figure 1 Site Location Map

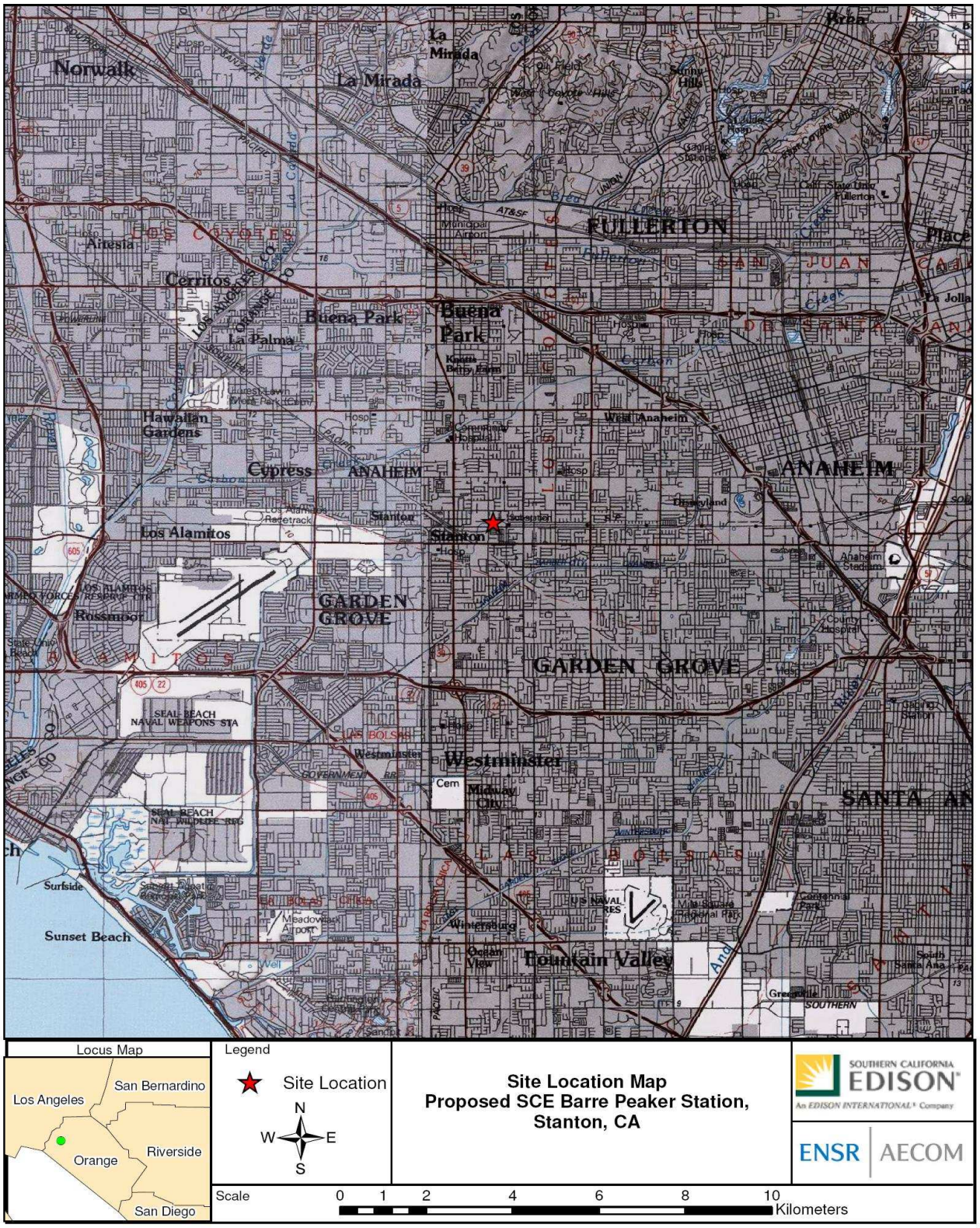
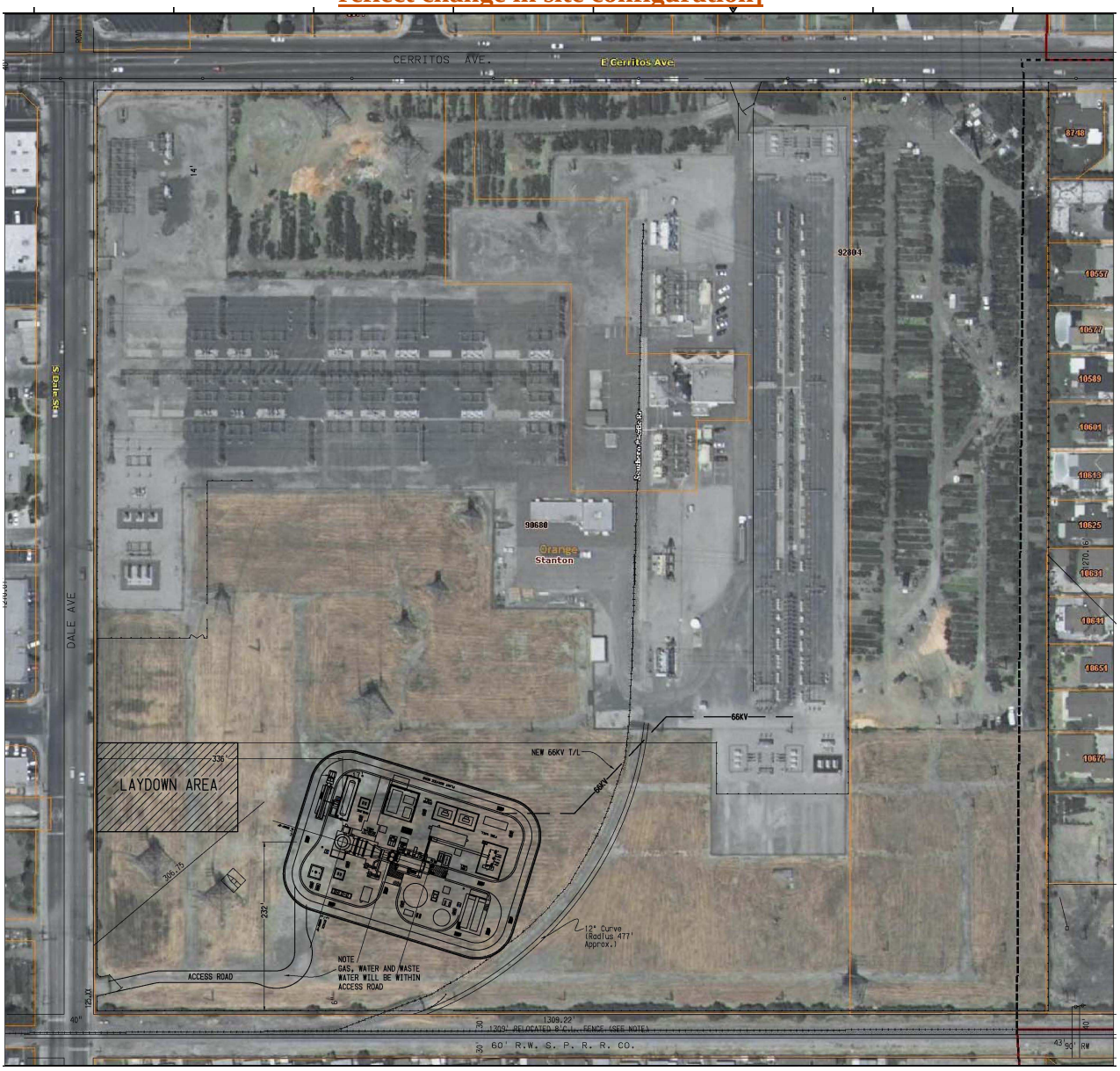


Figure 2 Aerial Photograph of the Facility with Plot Plan [Revised from Draft MND to reflect change in site configuration]



Project Description

The August 15, 2006 ACR also included reference to the California Independent System Operator's (CAISO) August 9, 2006 letter (CAISO 2006) to the CPUC "… urge[ing] the CPUC to direct the state's investor-owned utilities … to solicit a combination of quick-start generation and demand response opportunities that can be developed over the next six to 12 months to increase available supply at the peak hours and enhance grid reliability." A copy of the ACR is provided in **Appendix A**.

To implement this latter directive, SCE is taking steps to install five separate peaker generator projects either within or near existing substations at five strategic locations around southern

California, as listed in **Table 1**. **Figure 3** shows the relative locations of the proposed facilities. The proposed project represents one of the five peaker projects. These five peaker projects will enhance the reliability of the electric grid system in the region.

Table 1
Five Proposed Peaker Generator Projects

Proposed Peaker Plant	Location	MW
Center	City of Norwalk	45
Barre	City of Stanton	45
Etiwanda	City of Rancho Cucamonga	45
Mira Loma	City of Ontario	45
Mandalay[1]	City of Oxnard	45
[1]The Mandalay facility is located outside of SCAQMD's jurisdiction.		

The proposed peaker unit will be connected to the local lower-voltage distribution grid. The unit will be used to supply local electricity needs and sustain local distribution voltages and frequencies within acceptable limits during times of system strain or imbalance. Such strains on the system can occur during periods of prolonged high demand, when a high-voltage transmission line goes out of service, or when a generator unexpectedly goes offline. Adequate voltage and frequency support results in electric power of higher quality, which benefits industrial and electronic equipment. Without sufficient grid support, severe electric grid imbalances or system strains can result in a "cascading blackout," which could leave much or all of the southern California electrical grid system without power.

The proposed peaker unit will assist southern California in meeting required standards for local reserve capacity during periods of peak demand. If local reserve capacity falls below CAISO limits, the CAISO must initiate "rolling blackouts" to reduce electrical use on the system. Rolling blackouts are undesirable and adversely affect customers. In addition, they pose safety risks to hospitals, health care facilities and traffic. If sufficient peaking capacity is available, rolling blackouts are not required to ensure grid reliability. Finally, the proposed peaker unit is being strategically sited near an existing substation to provide "black start" capability. With black start capability, in the event that the local electrical system does experience a blackout, the peaker will be able to start without the rest of the system in operation. It can then be used to start other local generating stations and bring the electrical system back on line quickly and efficiently.

Figure 3 Relative Location of Five Proposed Peaker Plants

Equipment Description

Combustion Turbine Generator. The main project facilities will include one GE LM6000 gas turbine generator with a rated net output of approximately 45 MW. The turbine consists of a heavy duty, single-shaft, combustion turbine-generator and associated auxiliary equipment. The turbine is designed to fire natural gas only. The turbine is capable of stable operation at 50 to 100 percent load while meeting specified emissions performance criteria. The turbine is equipped with accessories required to provide efficient, safe, and reliable operation, including the following:

- Inlet air filters and on-line filter cleaning system,
- Evaporative inlet air coolers,
- On-line and off-line compressor wash system,
- Fire detection and protection system,
- Lubrication oil system, including oil coolers and filters,
- Generator coolers,
- Starting system, auxiliary power system, and control system, and
- Acoustical enclosures designed for outdoor service.

Emission controls for the combustion turbine include water injection and a selective catalytic reduction (SCR) system with 19 percent aqueous ammonia injection for nitrogen oxide (NOx) emissions control. An oxidation catalyst will be provided for volatile organic compounds (VOC) and carbon monoxide (CO) emissions control. Emission controls will be pre-fabricated offsite for rapid assembly during construction. The grading and foundations will be constructed concurrent with the foundation for the turbine. NOx, CO and sulfur oxides (SOx) emissions from the turbine will be monitored using a Continuous Emissions Monitoring System (CEMS). An 80-foot stack will exhaust turbine emissions.

Black Start Generator. The proposed project will have a natural gas-fired Waukesha VGF Series Gas Enginator Generating System. The engine is rated at 865 horsepower (Hp) and produces 645 kilowatt (KW) of electric power. The engine is a lean-burn, four stroke, turbocharged engine that meets U.S. Environmental Protection Agency (EPA) Tier 2 engine standards. This generator is used for "black start" capability for the facility. (Please see the **Process Description** below for an explanation of "black start".)

Support Equipment. The support equipment needed to operate the facility will include the following:

- 19 percent aqueous ammonia storage tank (10,500 gallons)
- Fuel gas compressor, electric powered (800 Hp)
- Raw water storage tank (125,000 gallons)
- Water demineralizer system and deionized water storage tank (50,000 gallons)
- Transformers, and
- Power Control Module.

Temporary Construction Areas. In addition to the 220- by 320-foot project facility, an approximately 450- by 450-foot construction staging area will be required. The staging area is used for storage equipment as it arrives onsite (prior to installation) and storage of supplies and materials. Temporary parking space for 35 to 40 construction workers will also be provided on site.

Natural Gas Pipeline. A pipeline will be required to supply natural gas to the project site. The pipeline will be 8-inch diameter, with a length of approximately 2 miles. The pipeline will be installed at a minimum depth of 36", with a planned depth of 42". The maximum depth of the pipeline may vary, and depends on the location of existing substructures that will be encountered along the proposed route. The pipeline route has not been finalized, but is expected to travel westward from the project site onto Dale Avenue, then south on Dale to tie into a main gas line located within Lampson Avenue.

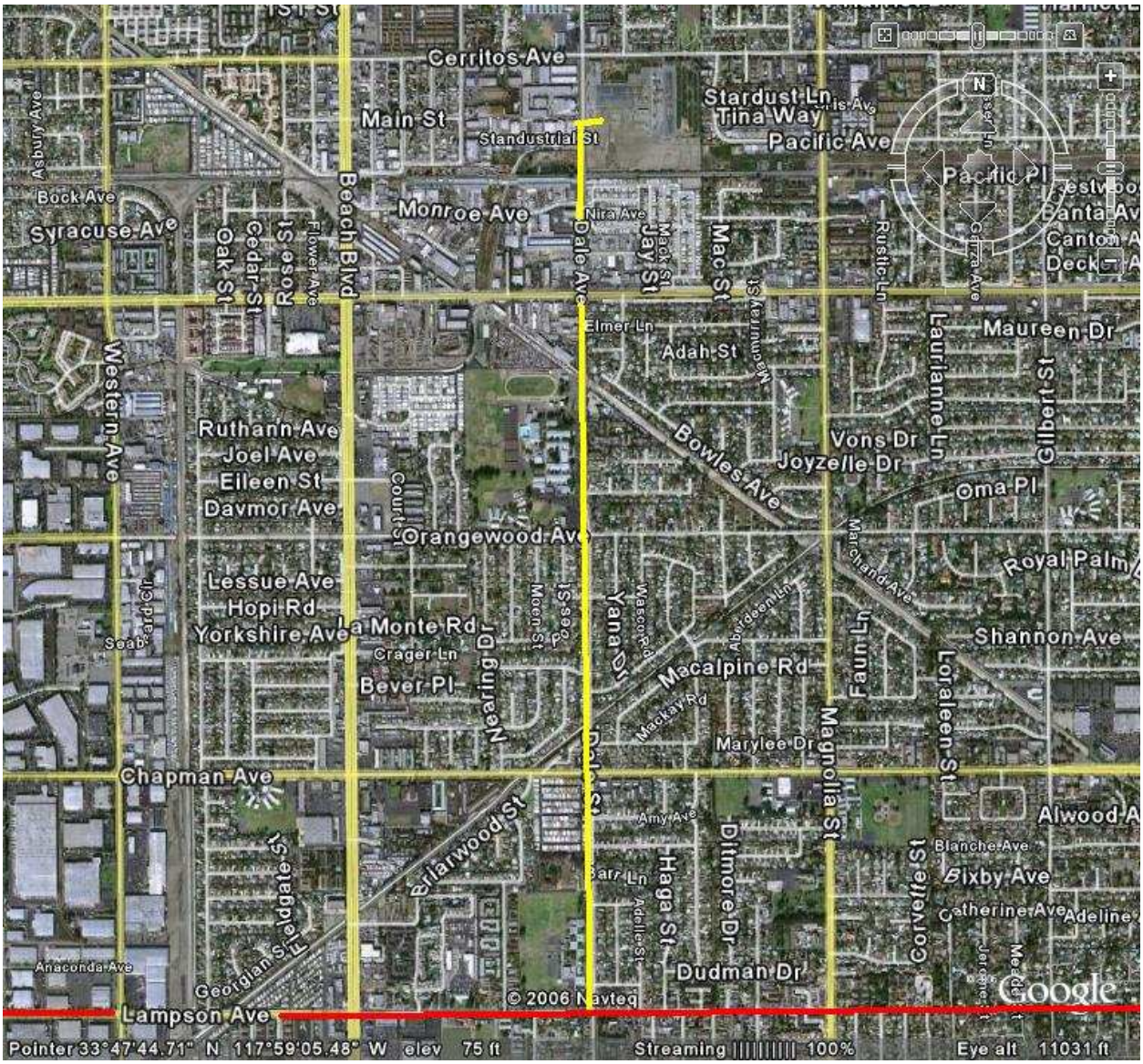
A gas metering station of approximately 40 by 75 feet in size will also be constructed on substation property in order to measure the amount of natural gas being used by the project.

Pipeline construction is expected to take place concurrent with the peaker plant construction and will take approximately 43 working days to complete. Construction equipment required for pipeline installation includes pipe trucks, dump trucks, welding equipment, backhoes, conventional boring equipment and lifting equipment. A construction crew of up to 20 people is required for pipeline construction. The construction crews will be at various locations along the proposed route during construction. A 200- by 300-foot staging area will be required adjacent to the pipeline route for material storage and parking. The staging area will be located in a non-sensitive area and appropriate environmental surveys will be performed prior to mobilization at the site.

The pipeline will be constructed within existing paved roadways, and the construction process would proceed in the following general order: (1) pre-construction activities, including surveying, staking, and pavement cutting; (2) trenching; (3) hauling, stringing, and bending the line pipe; (4) lowering in, line-up, and welding; (5) weld inspection; (6) application of protective coating to weld joints; (7) backfilling and compaction; (8) hydrostatic testing; and (9) cleanup, paving, and restoration. Please see **Figure 4** for the proposed pipeline route. The construction area will extend between 2,000 to 3,000 feet in length and progress an average of 300 to 500 feet per day. SCE anticipates that lane closure may be required for pipeline construction; however, road closure is not anticipated. Construction at special crossings such as intersections and freeway crossings will be performed by special crossing crews ahead of the main construction spread. It is anticipated that trenches within the roadways will be covered with steel plates and roadways will be open to traffic during non-working hours.

Other Connections. The new peaker power plant will be connected to SCE's existing Barre Substation. The peaker plant will be connected to the grid using a 66kV transmission tap line. Water and sewer connections will be made to existing lines in the adjacent street at Dale Avenue.

Figure 4 Pipeline Route



New pipeline route shown in yellow; existing gas main shown in red.

Process Description

The operation of each of the major project components is explained in the following sections. A simplified process flow diagram is provided in **Figure 5**.

Basic Equipment. Thermal energy is produced in the LM6000 turbine through the combustion of natural gas, which then is converted into mechanical energy by the turbine section that drives the inlet air compressor (integral with the turbine) and electric generator. The turbine consumes natural gas, water, and air, each of which is conditioned prior to use, as explained below.

- Natural gas is provided from the local pipeline, and will be pressurized by an 800-Hp electric fuel gas compressor.

- Water is supplied to the project from the Golden State Water Company. The water is treated with a demineralizer which consists of either a skid-mounted or trailer-mounted ion exchange system. Treated water is stored in a storage tank prior to use. The treated water is directly injected into the turbine for further NOx emissions control.

- Ambient air is filtered through a self cleaning filter prior to use. In addition, the project includes an inlet air cooler that may or may not be used, depending on ambient conditions. The inlet air cooler conditions combustion air using evaporative cooling by injection of a fine mist of water directly into the air stream.

The material usage rates for the combustion turbine are shown in **Table 2**. Aqueous ammonia is necessary for effective operation of the SCR system which controls NOx emissions. SCE is requesting a permit condition from the SCAQMD to limit the annual mass emissions to below the SCAQMD's emissions offset thresholds for all criteria pollutants[3] in accordance with Rule 1304. This requested condition effectively limits annual consumption of each of the raw materials. The LM6000 turbine is designed for up to 120 startups per year; however, based on its anticipated use as a peaker, startup frequency will likely be less.

Black Start Generator. The proposed peaker project is designed with "black start" capability. A combustion turbine requires electric power to initiate operation – the fuel gas compressor must compress the natural gas and, similar to an automobile engine, an electric motor must spin the turbine to start it. Most turbine-based power plants draw power from the regional electric grid for their start-up power requirements. In a situation when there is a blackout on the grid, starting the turbine using power from the grid is not possible.

Thus, to provide black start capability, the proposed project will be equipped with a natural gas-fired spark ignition engine that powers a 645 KW generator. The generator engine is started using battery power and once started, provides sufficient power to start the combustion turbine. Once the turbine is online, the black start generator is shut down.

3 Criteria pollutants are NOx, SOx, CO, VOC, and particulate matter (PM10).

Figure 5 Process Flow Diagram

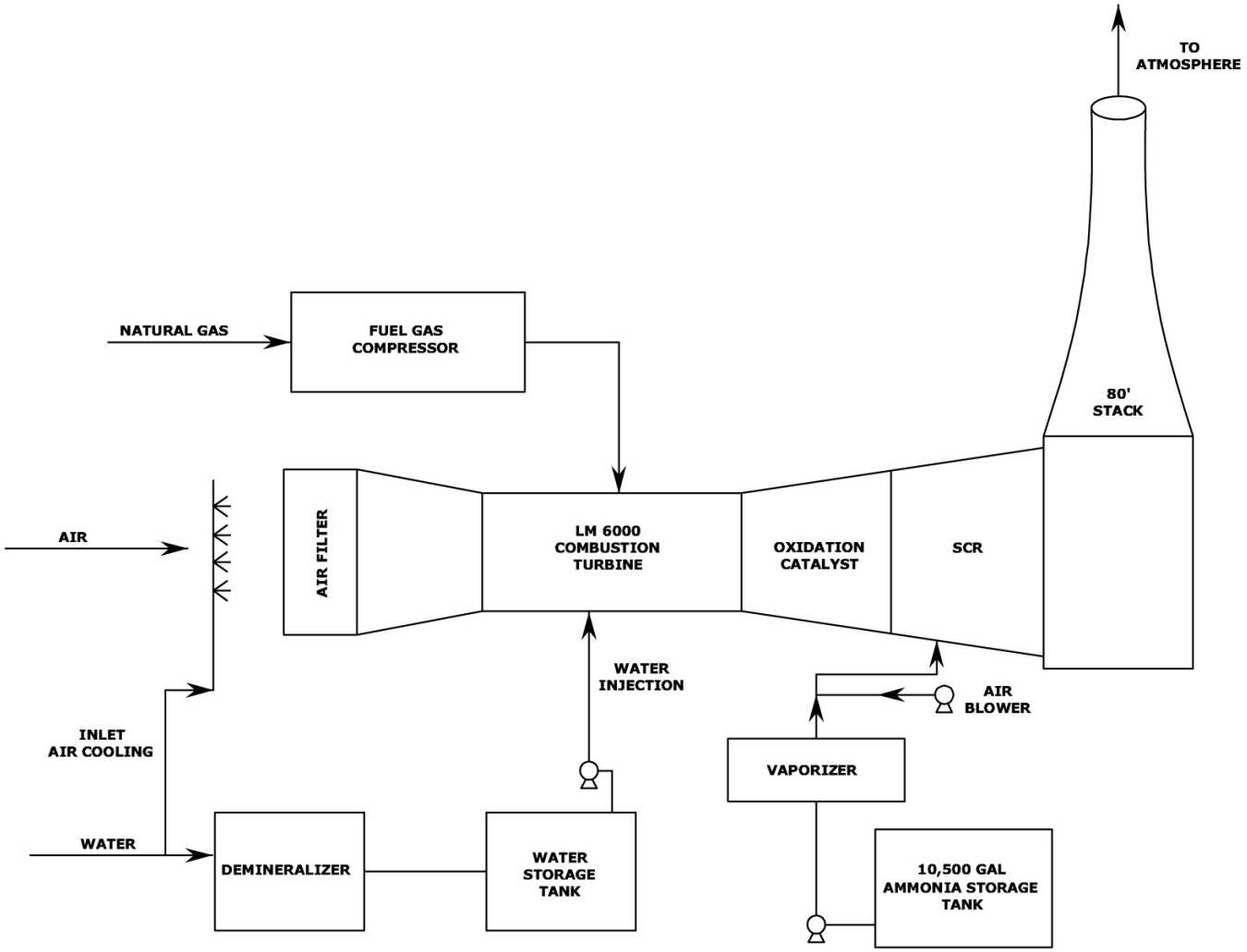


Table 2
Material Usage Process Rates

Raw Material	Consumption Rate
LM6000 Turbine	
Natural Gas	4.27×10^5 scf/hr 6.13×10^8 scf/year (first year) 7.07×10^8 scf/year (subsequent years)
Water	62 gallons per minute 7.09×10^6 gallons per year
Ammonia (19 percent)	0.27 gallons per minute 21,491 gallons per year
Black Start Generator	
Natural Gas	6,124 scf/hr 85,733 scf/year

Operating Schedule

As a peaker facility, the proposed project is expected to have limited hours of operation. SCE anticipates that the plant will be operated primarily during peak electricity demand periods. These periods typically occur during the hot summer months when demand for electricity to operate air conditioning units and fans is high. However, the facility could operate at any time during the year, depending on the local grid performance and regional energy demands. In addition, SCE plans to operate the power plant periodically, typically one day per month for a short period of time (typically one to eight hours) to ensure reliability of the system and resolve any problems before the peaker is needed.

As a peaker power plant, daily and annual operating hours will depend on electrical demand and grid performance. However, emissions were calculated assuming 120 start up and 120 shut down events per year, 11 operating hours per day and 1,416 operating hours per year. The number of start ups, shut downs and operating hours are reduced slightly in the first year of operation due to commissioning activities, as explained in more detail in Chapter 2, Section 3 of this IS. The air permit for the project will contain a monthly emission limit based on 11 hours per day of operations.