

Executive Summary

1.1 Introduction

This Application for Certification (AFC) for the Carlsbad Energy Center Project (CECP) has been prepared by the Carlsbad Energy Center LLC (Applicant) in accordance with the California Energy Commission's (CEC) Power Plant Site Certification Regulations (February 2007). This Executive Summary provides an overview of the project in accordance with Appendix B, Section (a) of the regulations.

The CECP project is located on approximately 23 acres of the existing Encina Power Station in the City of Carlsbad. The Applicant is proposing to develop the CECP to meet the electrical resource needs identified by San Diego Gas and Electric (SDG&E). This includes contributing to electricity reserves that will ensure a reliable energy supply and local and regional electrical transmission grid support in San Diego County and the southern California region.

This AFC has been prepared in accordance with CEC guidelines and provides:

- A detailed description of the CECP.
- An assessment of the project's likely impact on the existing environment.
- Measures proposed by the Applicant to mitigate potential project impacts to ensure that environmental issues are properly and responsibly addressed.
- A discussion of compliance with applicable laws, ordinances, regulations, and standards (LORS).

1.2 Project Overview

The Applicant proposes to develop a natural gas-fired generating facility in the City of Carlsbad (see Figure 1.2-1, figures are located at the end of the section) in San Diego County (County), California. The CECP will be a fast-start high-efficiency, combined-cycle facility that will support San Diego Gas & Electric's local load and provide overall system reliability.

The design of the project utilizes technology that provides rapid response to demand, while at the same time providing combined-cycle efficiencies. This unique balancing makes CECP an invaluable and important contribution to power generation in California. Another critical component of the CECP generating units is that the project will be air cooled, thereby avoiding the need to connect to the existing Encina Power Station's sea water once-through-cooling system. For the project's raw water needs, CECP will use CCR Title 22 reclaimed water, thereby, minimizing its use of potable water.

CECP will consist of the following components:

- 540.4-megawatts (MW) net (at 73.6 degrees Fahrenheit [°F] with steam power augmentation and evaporative cooling) 558 MW gross combined-cycle generating facility configured using two trains with one natural-gas-fired combustion turbine generators (CTG) and one steam turbine generator (STG) per train (or unit).
- Interconnection to the existing electrical transmission system via 138-kilovolt (kV) and 230-kV lines that connect to the existing 138-kV and 230-kV SDG&E substations located on the Encina Power Station.
- Approximately 1,100 feet of new 18-inch-diameter natural gas pipeline connecting to the existing SoCalGas transmission pipeline (Line TL 209, "Rainbow Line) which is adjacent to the CECP site on the west side of the existing rail line.
- Approximately 1,100 feet of new 12-inch sanitary sewer line.
- CECP will use California Code of Regulation (CCR) Title 22 reclaimed water supplied by City of Carlsbad and delivered to the CECP via a new 12-inch pipeline from the interconnection point at Cannon Road and Avenida Encinas (approximately 3,700 feet long).
- CECP will use City of Carlsbad potable water by connecting to an existing water main located approximately 1,100 feet from the project site.

Figure 1.2-2 shows the project location. The site is located in an industrial area in the City of Carlsbad, in San Diego County. Figure 1.2-3 shows the location of the generating facility, electric transmission lines, natural gas supply pipeline, reclaimed water supply pipeline, and potable water supply line. The total acreage of the existing Encina plant site is 95 acres, with the CECP utilizing approximately 23 acres.

The generating facility will consist of two power blocks, each having one CTG equipped with Ultra Low Nitrogen oxide (ULN) combustors; one heat recovery steam generator (HRSG); one condensing STG; an air-cooled fin-fan cooler; and associated support equipment. The combustion turbines will be Siemens Rapid Response SCC6-5000F Combined Cycle (R2C2) units. Black start capability is provided by the existing Encina combustion turbine generator via new electrical connections to each new power generation train.

Each unit combines the fast starting capability of a simple-cycle gas turbine and the efficiency of a combined cycle-plant in a cost-effective design. Each unit is designed to start and ramp up to 150 MW in ten minutes and still be capable of operating with combined-cycle efficiency. The fast-start capability is a requirement for peaking applications and has the additional benefit of reducing start-up emissions compared to a conventional combined cycle plant. The Heat Recovery Steam Generator is designed for fast start and incorporates a conventional, proven selective catalytic reduction (SCR) design to achieve the guaranteed emissions at load.

The CTG exhaust gases will be used to generate steam in the HRSG. The HRSG will be a single pressure, non-reheat design. Steam from the HRSG will be admitted to a condensing

STG for power production. The project is expected to have an overall annual availability of 92 to 98 percent.

Associated equipment will include emission control systems necessary to meet the proposed emission limits. One-hour nitrogen oxide (NO_x) emissions will be controlled at the stack to 2 parts per million by volume (ppmv), dry basis, corrected to 15 percent oxygen by a combination of ULN combustors in the CTG and SCR systems in the HRSGs. An oxidation catalyst will be installed in the HRSGs to limit 3-hour stack carbon monoxide (CO) emissions to 2 ppmv. VOC emissions will also be limited to 2 ppmv @ 15 percent oxygen for gas turbine 60% to 100% load.

The electrical transmission interconnections will link CECP to the power grid by connecting the plant to the SDG&E Encina Substation at two voltages (138 and 230 kV). Power will be generated by the two CTGs and by the two STG's and then stepped up by 2 transformers for each train to 138 kV and 230 kV, respectively, for high voltage feed to the respective existing Encina Substation.

Natural gas will be delivered to the site via 18-inch-diameter pipeline (see Section 4.0). This 1,100-foot-long pipeline will extend from the existing SoCalGas transmission pipeline (Line TL 2009, "Rainbow line") which runs immediately adjacent to the plant site, on the west side parallel to the existing rail line. At the plant site, the natural gas will flow through a flow-metering station, gas scrubber/filtering equipment, a gas pressure control station, and electric-driven booster compressors prior to entering the combustion turbines.

The CCR Title 22 reclaimed water will be delivered to CECP by the City of Carlsbad through a recycled water pipeline from a connection point in the existing pipe system at Cannon Road and Avenida Encinas.

Potable water will be provided to the plant from existing city water lines. It will be used for drinking, safety showers, eye-wash, fire protection, and service water. It will also serve as an emergency water supply, should the recycled water be unavailable for an extended period of time. Sanitary wastewater disposal will be through City of Carlsbad (Encina Wastewater Authority's) sanitary sewer system.

Sanitary wastewater disposal will be to City of Carlsbad (Encina Wastewater Authority's) sanitary sewer system. A new line connection will be added to connect to the Authority's system. A new 12-inch sanitary sewer line would exit the plant site from the west side of the site and connect with the Authority's existing wastewater pipe which runs immediately adjacent to the plant site on the west side, parallel to the existing rail line. The total distance of the new line would be approximately 1,100 feet.

1.2.1 Project Objectives

The Applicant's objectives for the CECP, which provide significant advantages and benefits to the region, are as follows:

- Meeting the commercial qualifications for long-term power contract opportunities in southern California.
- Meeting the expanding need for new, highly efficient, reliable electrical generating resources located in the load center of the San Diego region.

- Improving the San Diego electrical system reliability through fast starting generating technology, creating a rapid responding resource for peak demand situations and providing a dependable resource to backup less reliable renewal resources like wind generation.
- Modernizing the existing aging electrical generation infrastructure in north coastal San Diego County. Modernization of aging electrical generation infrastructure is a primary objective shared by energy and environmental agencies in California, including the California Public Utilities Commission (CPUC), CEC, California Independent System Operator, and publicly owned utilities.
- Accomplishing a “brownfield” redevelopment of an existing power plant for a net increase in electrical capacity to support electrical system and local resource supply requirements in the San Diego area. The California Public Utility Commission has a stated preference for “brownfield” power projects pursuant to Decision No. 04-12-048.
- Facilitating the retirement of existing Units 1 – 3 at the Encina Power Station consistent with the following City of Carlsbad’s land use programs and to set in motion actions that are likely to facilitate the eventual retirement of Units 4 and 5 at the Encina Power Station:
 - City of Carlsbad General Plan
 - City of Carlsbad Zone Code
 - Encina Power Station Specific Plan 144
 - Encina Power Station Precise Development Plan
 - Agua Hedionda Land Use Plan
 - South Carlsbad Coastal Redevelopment Plan, including moving forward with the primary Plan objective to “Facilitate the redevelopment of the Encina Power Generating Facility to a physically smaller, more efficient power generating plant.”
- Utilizing existing Encina Power Station infrastructure to reduce environmental impacts and costs. The infrastructure at the Encina Power Station will support the CECP with only minor new connections including to the existing: high pressure natural gas, industrial/sanitary sewer, potable water, and the existing SDG&E 138-kV and 230-kV switchyards at the Encina Power Station.
- Utilizing CCR Title 22 reclaimed water raw water source for the CECP. The use of reclaimed water by CECP represents a significant project benefit as use of potable water will be limited to sanitary uses and fire protection.
- Significantly reducing the volume of seawater used for once-through-cooling at the existing Encina Power Station by facilitating the retirement of existing Units 1 – 3.
- Meeting applicable LORS of the CEC, City of Carlsbad, and other agencies.

1.2.2 Project Site Selection

The Applicant’s approach to project site selection focused on identifying potential project sites that satisfy the basic project objectives and which have a low potential for

environmental impacts. In addition, the site selection focused on sites designated as Public Utility in the City of Carlsbad General Plan and zoning code, as the Public Utility designation allows for electrical general and transmission facilities. The site selection process focus largely on sites on and near the Encina Power Station based on the availability of the critical infrastructure at the Encina Power Station to support the project (i.e., natural gas, reclaimed and potable water, sanitary/industrial sewer, electrical transmission grid connection). However, the Applicant also considered other sites located within the City of Carlsbad. The selection of the CECP site is consistent with these site selection criteria.

1.3 Facility Location

The CECP site is located in the City of Carlsbad, San Diego, California (see Figure 1.2-1 and Figure 1.2-2). The site address is 4600 Carlsbad Blvd, Carlsbad, California 92008. The CECP site is part of the 95-acre Encina Power Station located in Township 12 South, Range 4 West, Section 7, in San Diego County. The Encina Power Station is comprised of the following Assessor Parcel Numbers (APNs): 210-01-41 (project site) and 210-01-43.

The two new units (designated Units 6 and 7) will be on the northeast area of the existing Encina Power Station (see Figure 1.2-3), between the existing rail line and Interstate 5 (I-5), and at the location of three previously existing fuel oil tanks. The CECP site will consist of approximately 23 acres. About 3 acres on the existing Encina site will be available during construction for parking and approximately 7 acres will be available for construction equipment/material laydown.

A photograph of the CECP site prior to construction and a simulation of the CECP and its onsite transmission interconnection after construction are presented as Figure 1.3-1.

The project site is located in the central portion of the City of Carlsbad, adjacent to the Pacific Ocean and immediately west of I-5. Carlsbad Boulevard (also designated as County Highway S21) is located west of the project site and the Agua Hendionda Lagoon is located adjacent to the site to the north. An existing railroad line is adjacent to the site to the west. The predominant uses in the vicinity are mainly industrial, with residential and commercial uses located nearby.

Parcel numbers and the names of the landowners within 1,000 feet of the plant site and within 500 feet of the centerline of the linear corridors are included in Appendix 1A.

1.4 Project Schedule

The project schedule from submission of the AFC to the CEC, permitting, engineering design, construction, commissioning and commercial online date for the two units is shown on Figures 1.4-1A and 1.4-1B. As shown, construction of the generating facility, from site preparation and grading to commercial operation, is expected to begin in the Fourth Quarter of 2008. There are two construction schedule and commercial online dates (CODs) options for the CECP as follows, both of which are addressed in this AFC:

- Single Phase Construction with the simultaneous construction of both generating units with a single COD for both units in the Second Quarter of 2010 (a total of 19 months for

construction and commissioning for both units). The major milestones for Single Phase Construction are shown on Figure 1.4-1A.

- Phased Construction with the construction of the two units still beginning in the Fourth Quarter of 2008, but with one unit ready for commercial operations in 19 months, by the Second Quarter of 2010, and the second unit ready for commercial operations in 25 months, by the First Quarter of 2011. The major milestones for the Phased Construction are shown in Figure 1.4-1B.

As applicable, both the Single Phase Construction and Phased Construction schedules are addressed in those sections of the AFC for which the construction and commissioning impacts are different between the two construction schedules (e.g., Air Quality, Traffic and Transportation, and Socioeconomics). The construction and COD schedule selected for the project will be based on the terms of a negotiated Power Purchase Agreement (PPA).

1.5 Project Ownership

The CECP (including the underlying parcel) will be owned by the Carlsbad Energy Center LLC, an indirect wholly owned subsidiary of NRG Energy, Inc., which also indirectly owns Cabrillo Power I LLC, the owner of the existing Encina Power Station. The transmission lines will be owned by the SDG&E. The connection to the potable water, reclaimed water, and sewer lines will be owned by the City of Carlsbad. SoCalGas owns the gas transmission line, which will provide gas transportation delivery to a project's gate meter. The gate meter and its line extension and the tap to SDG&E's system will be installed, owned, and operated by SoCalGas. The extension beyond the gate meter to CECP site will be constructed and owned by the Carlsbad Energy Center LLC.

The initial capital cost of the CECP is estimated to be \$350 million to \$450 million. The estimated value of materials and supplies that will be purchased locally (within San Diego County) during construction is estimated at approximately \$30 million. All estimates are in 2007 dollars.

1.6 Project Alternatives

The CEC conducts its review of alternatives to satisfy the Warren-Alquist Act and the California Environmental Quality Act (CEQA). Appendix B(f)(1) of the CEC Guidelines requires a discussion of the range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project. To enable this review, the criteria and objectives that led to the selection of the site and design features of the proposed project are provided, along with a detailed discussion of the range of alternatives considered (see Section 6.0, Alternatives).

A "No Project" alternative was considered and rejected as inconsistent with the Applicant's objectives, which include the need to develop additional reliable local generation sources. In addition, the "No Project" alternative could result in greater fuel consumption and air pollution in the state because generation from older, less-efficient plants with higher air

emissions would not be replaced by generation from cleaner, more-efficient plants, such as CECP.

Other possible alternative sites in the general vicinity of the proposed site were reviewed, but none were identified that would attain most of the basic project objectives. Alternative routes for the potable and reclaimed water, wastewater, and transmission lines were not developed because of the shortness of their length (i.e., less than 0.7 mile).

Several alternative generating technologies were reviewed in a process that led to the selection of a modern, proven, combustion turbine combined-cycle arrangement for CECP using natural gas for fuel. The alternative technologies included conventional oil- and natural-gas-fired plants, simple-cycle combustion turbines, biomass-fired plants, waste-to-energy plants, solar plants, wind-generation plants, and others. None of these technologies are feasible alternatives to the combined-cycle technology selected for CECP. A complete discussion of project alternatives is presented in Section 6.0.

1.7 Environmental Considerations

Sixteen areas of possible environmental impact from the CECP were investigated. Detailed descriptions and analyses of these areas are presented in Sections 5.1 through 5.16 of this AFC. With the implementation of reasonable and feasible mitigation measures, there will be no significant environmental effects. The potential effects of these areas are summarized briefly in this section.

1.7.1 Air Quality

The project site is located in an area designated as nonattainment for State and Federal air quality standards for ozone, and for State respirable particulate matter (PM₁₀) and fine particulate matter (PM_{2.5}) standards. The area is designated as attainment for state and federal nitrogen dioxide (NO₂), carbon monoxide (CO), and sulfur dioxide (SO₂) air quality standards. The potential air quality impacts from the CECP will be mitigated by the installation and operation of Best Available Control Technology (BACT) for the gas turbines and emergency firepump engine and by retirement of existing Units 1, 2, and 3 at the Encina Power Station. Emission reductions from the shutdown of these units will represent “real-time” emission reductions and will be used to offset the project’s emissions. These mitigation measures will result in the project having no significant adverse impact on air quality. See Section 5.1 for a detailed analysis of air quality.

1.7.2 Biological Resources

Although sensitive plant and wildlife species and sensitive vegetation communities are known to occur within the vicinity of the CECP site, they are essentially restricted to the estuarine and open water habitats associated with the Agua Hedionda Lagoon and the surrounding natural habitats and are not expected to occur within the CECP site. The CECP site is characterized by a combination of developed areas, disturbed habitat, and ornamental landscaping. Therefore, construction and operation of the project will not result in the removal of native vegetation communities or sensitive plants species. However, the noise analysis identifies the potential for increased noise levels during CECP construction. These increased noise levels will require implementation of various avoidance and minimization

measures to reduce potential temporary noise impacts to wildlife within the CECP site and surrounding areas. For example, in addition to construction timing restrictions as feasible, a preconstruction survey will be conducted for nesting raptors and other special-status bird species prior to ground disturbing activities. If nesting raptors, special-status bird species, and/or other sensitive biological resources are identified during the preconstruction survey, then the appropriate resource agencies will be contacted and monitoring will be implemented. There is also the potential for increased avian collisions with the stacks and transmission lines. However, low stack height and downward-facing lighting on the stacks and protective design features of the transmission lines will be implemented so that the potential for avian collisions will be less than significant.

Impacts to aquatic species are not anticipated due to the project's dry cooling system, which will avoid a thermal plume or water intake and outflow issues that could affect fish or other aquatic biota during operations. Additionally, once CECP is in operation, three units at the Encina Power Station (Units 1 - 3) will be retired, and the volume of sea water used for once-through-cooling at the Encina Power Station will be significantly reduced. This reduction will result in a decrease in impingement and entrainment effects at the Encina Power Station. As a consequence of the development and implementation of these avoidance and minimization measures and design features, significant impacts to biological resources are not anticipated from the construction and operation of CECP. See Section 5.2 for details about the project effects on biological resources.

1.7.3 Cultural Resources

Archival research and both archaeological and architectural field surveys failed to locate any significant archaeological sites, architectural resources, or traditional cultural properties within the CECP area of potential effect (APE) for cultural resources. Three archaeological sites are located near the CECP site, but none are considered significant; all fall outside the direct APE and none will be impacted by the CECP. All other previously recorded sites are located well outside of the CECP APE, and the project will have no effect on them. None of the standing structures in the study area are historical resources for the purposes of CEQA. Given the scale and scope of previous ground disturbance in the area by construction of the entire Encina Power Station, including tanks 4, 5, 6, and 7, and in addition to the large amounts of fill material used and the overall scope of ground disturbance at the site, archaeological sensitivity of the specific location of the CECP site is considered low.

Although significant archaeological and historical sites were not found during survey for the CECP, it is possible that subsurface construction could encounter buried archaeological remains. For this reason, the CECP will include measures to mitigate any potential adverse impacts that could occur if there were an inadvertent discovery of buried cultural resources. See Section 5.3 for details on the project analysis of potential effects on cultural resources.

1.7.4 Land Use

The CECP will be located within the existing Encina Power Station which is subject to several land use policy requirements of the City of Carlsbad. In particular, the existing Specific Plan 144 and the Encina Power Station Precise Development Plan, that cover the

area in the vicinity of the Encina Power Station, will need to be amended contemporaneously with the processing of this AFC.

Although the CECP is located in the coastal zone, the CEC has permit authority for the licensing of any power plants greater than 50 MW, however, the California Coastal Commission (CCC) will play a role consistent with the CEC Siting Regulations because of the CECP location within the coastal zone. The CCC's participation in the CEC process replaces the normal CCC permitting process that would normally apply to a project in the coastal zone. As a result, the CCC is expected to submit a report to the CEC regarding consistency of the CECP with CCC policies related to environmental resource protection. All coordination with the City of Carlsbad and the CCC is expected to occur during the CEC licensing process.

The CECP has been designed to comply with current land use planning expectations of the City of Carlsbad and of the community. For instance, the new units are located away from the coastal front of the parcel and are air-dry cooled so they do not use sea water for once-through-cooling. Further, the project involves the retirement of Units 1 -3 at the existing Encina Power Station that will significantly reduce the volume of seawater used at by the Encina Power Station for once-through cooling. Thus, the CECP is consistent with all relevant federal, state, and local plans and policies, and as such, there are no land use impacts associated with the implementation of the project. There are also no cumulative land use impacts associated with the implementation of the CECP and other large projects in the vicinity of the CECP. See Section 5.6 for details about the project effects on land use.

1.7.5 Noise

The City of Carlsbad has established land use compatibility guidelines for noise at residential areas of 60 dBA Community Noise Exposure Level (CNEL). For this AFC, 25-hour community noise monitoring was conducted and a model was used to predict of project noise levels at the closest receptors. Sources of existing noise are primarily transportation related and include I-5, local roads in addition to commuter and freight rail traffic. The modeling shows that noise attributable to the project at the closest residential receptors complies with the City's standards. In accordance with the Carlsbad Municipal Code, construction activities are permitted to occur 24 hours a day, 7 days a week provided they do not create disturbing, excessive or offensive noise. There is the potential for double shifts that would expand the hours of project construction; however, noisy construction work (that causes offsite annoyance as evidenced by the filing of a legitimate noise complaint) will be confined to between 7:00 am and 7:00 pm unless an exception to these hours is granted by the Certified Building Official (CBO). See Section 5.7 for details about the project effects on noise.

1.7.6 Public Health

The potential for impacts on public health was evaluated relative to project emissions of both criteria pollutants and toxic air contaminants (see Section 5.9). As demonstrated in the air quality analysis (see Section 5.1), criteria pollutant emissions would not cause exceedances of ambient air quality standards that have been promulgated by the federal government and State of California to protect the public health of the most sensitive population groups with a margin of safety. A detailed health risk assessment of potential

health impacts from toxic air contaminants was conducted according to guidelines and requirements from the California Office of Environmental Health Hazard Assessment and San Diego Air Pollution Control District (SDAPCD). The assessment calculated the maximum potential cancer risk and non-cancer acute (short-term) and chronic (long-term) health hazards from the operational exhaust emissions of the proposed gas turbines and routine testing of the diesel-fueled emergency fire water pump engine. The resulting health impacts are far below the thresholds of significance established by the state and SDAPCD.

1.7.7 Worker Health and Safety

During the construction of the project, workers may be exposed to construction hazards, and during plant operation, operators may be exposed to plant operation safety hazards. To evaluate these hazards and control measures, a hazard analysis was performed. The analysis identifies the hazards anticipated during construction and operation, and indicates which safety programs should be developed and implemented to mitigate and appropriately manage those hazards. Programs are overall plans that set forth the method or methods that will be followed to achieve particular health and safety objectives. For example, the Fire Protection and Prevention Program will describe procedures to protect against and prevent fires. Each program or plan will contain training requirements that are translated into detailed training courses. Upon completion of construction and commencement of operations, the construction health and safety program will transition into an operations-oriented program reflecting safety hazards and the controls necessary during operation. As a consequence of the development and implementation of these plans and programs, workplace accidents would be minimized in both severity and frequency so that there would not be a significant impact to worker health and safety from the construction and operation of CECP.

1.7.8 Socioeconomics

Two construction phases were evaluated for the CECP – Single Phase Construction and Phased Construction. Total personnel requirements during construction will be approximately 4,494 person-months, or 375 person-years for the Single Phase Construction. Construction personnel requirements will peak at approximately 357 workers in month 13 of the construction period. The Phased Construction has a total personnel requirement of 4,434 person-months (or 370 person-years) and a peak of 325 workers in month 14. Construction duration is 19 months and 25 months, respectively, for the Single Phase and Phased Construction schedules.

The CECP will provide between \$53.9 million and \$54.6 million in construction payroll during Phased and Single Phased Construction periods, respectively. The CECP will also provide about \$30 million in construction expenditures that will be spent locally within San Diego County. All estimates are in 2007 dollars.

In addition to the direct economic benefits, secondary (indirect and induced) economic benefits were evaluated using the IMPLAN Input-Output (I-O) model. These include additional employment of 555 (indirect employment of 281 jobs and induced employment of 274 jobs) under the Single Phase Construction schedule and 421 (indirect employment of 214 jobs and induced employment of jobs) under the Phased Construction schedule. Indirect income ranges between \$8.4 million under the Phased Construction schedule and

\$11 million under the Single Phase Construction schedule. Induced income ranges between \$8.1 million (Phased Construction schedule) and \$10.8 million (Single Phased Construction schedule).

During the operation phase, the CECP will provide \$4.5 million in annual operations and maintenance (O&M) budget, most of which is assumed to be spent locally within San Diego County. Secondary (indirect and induced) economic benefits were evaluated using the IMPLAN I-O model. In addition, the model shows that the CECP will generate \$1,338,830 in indirect income and \$339,420 in induced income.

In addition to the employment and income generated during the construction and operation phases, the CECP will provide revenues in the form of sales and property taxes and natural gas franchise fees to the County and City of Carlsbad. The total local sales tax expected to be generated during construction is \$2,325,000 (i.e., 7.75 percent of local sales). Based on the assumed local annual O&M expenditures of \$4.5 million, the estimated annual sales taxes generated by the CECP will be approximately \$348,750.

Assuming a capital cost between \$350 million and \$450 million, CECP will generate between \$3,564,610 and \$4,583,070 in property taxes annually. Since the CECP is in a City of Carlsberg redevelopment area (the South Carlsbad Coastal Redevelopment Area), a portion of the property taxes collected from the project will go to the Redevelopment Agency; overall, the City will receive a greater portion of the property tax revenue on an annual basis.

The CECP will also pay the City of Carlsbad approximately \$2.4 million in gas franchise fees, based on an estimated \$111 million in annual natural gas purchases and a gas franchise fee of 2.13 percent of the total gas purchases.

1.7.9 Soils

Construction at the CECP site would disturb an area of approximately 11 acres for an estimated 19 to 25 months depending on the optional construction schedule implemented (Single Phase Construction of Phase Construction). Estimated construction corridor impact areas for other site features include the laydown areas (7 acres); a soil berm along the west side of site (about 1.5 acres); transmission lines (4.62 acres); reclaimed water line (4.21 acres); potable water line (1.38 acres); sanitary sewer line and natural gas supply line (1.26 acres each). Based on the implementation of construction best management practices (BMPs), estimates of the total maximum estimated soil loss by water and wind erosion were 1.55 tons and 1.78 tons, respectively. This conservative estimate of soil loss was not considered to be a significant impact. Given the requirements for permanent erosion control measures and the lack of serpentine soils in the project area, operational soil losses and offsite soil impacts will not be significant. For similar reasons, the cumulative impacts on soils in consideration with other projects in the area are not expected to be significant. The project will have no effect on jurisdictional wetlands or on lands currently used for agricultural purposes. See Section 5.11 for a detailed analysis of the project on soil resources.

1.7.10 Traffic and Transportation

To evaluate the potential effects of CECP construction traffic, a traffic study was conducted for key roadway segments and intersections where delays were expected to occur. The

analysis indicates that the CECP will not cause any significant traffic impacts (i.e., the increase in traffic delays is minimal). The anticipated disruption of traffic caused by trenching activities across Cannon Road associated with the reclaimed water pipeline will be mitigated by the implementation of a traffic control plan for the affected areas. Similarly, the hazards related to the potential traffic backup as workers enter the project site will also be mitigated using measures in a traffic control plan. Although the CECP does not introduce new design features that would substantially increase hazards, the Applicant recognizes the potential hazards related to the crossing of the existing onsite railroad track and will implement a proper safety plan to mitigate this risk.

Operations-related and maintenance-related traffic associated with the project are minimal and insignificant when considered in conjunction with the major movements on freeways and local roadways. Consequently, no long-term significant effects caused by the operation of the CECP are anticipated. See subsection 5.12 for detailed analysis of the project on traffic.

1.7.11 Visual Resources

This analysis of the visual effects of changes that might occur with implementation of the CECP is based on project maps, drawings, and technical data; aerial and ground level photographs of the project area; and computer-generated visual simulations. The project's viewshed is comprised of close range and more distant viewing locations within the vicinity including some areas around Agua Hedionda Lagoon and along nearby public roadway/railroad corridors as well as some places within residential areas and nearby public open space. To varying degrees, existing vegetation and development screen views of the CECP site from the surrounding areas.

To analyze and address the potential visual effect of the CECP, seven Key Observation Points (KOPs) have been selected in consultant with CEC staff. The Encina Power Station, including the existing power plant building and stack, appears prominently in views from these KOPs. The CECP site, while visible from some locations is fully or partially screened by intervening topography and vegetation from other locations. The project will be seen within the context of an existing Encina Power Station that is an established element of the landscape setting. The new CECP facilities will generally be substantially lower in height and smaller scale than the existing Encina Power Station facilities.

The visual impact assessment of the CECP is based on evaluation of the changes to the existing visual resources that would result from construction and operation of the CECP. Based on the visual analysis, the project will not obstruct open vistas toward the Agua Hedionda Lagoon or other distant landscape features as currently seen from any of the KOPs. In this respect, the CECP will be an incremental change which will not substantially alter the character or composition of the existing vistas which are currently experienced by the public. The incremental change brought about by the introduction of the CECP will not substantially alter the existing character of the panoramic view currently available

A comparison of "before" and "after" images from the seven KOPs demonstrates that the project will not obstruct open vistas toward the Agua Hedionda Lagoon. An existing landscaped berm situated at the site perimeter on the north, east and west will effectively screen portions of the CECP. Based on the analysis, the visual effects of the CECP are found

to be less than significant. See Section 5.13 for details on the project's affect on visual resources.

1.7.12 Hazardous Materials Handling

Hazardous materials to be used during construction and operation were evaluated for hazardous characteristics. Hazardous materials to be used during construction of the project (and its associated linear facilities) will include gasoline, diesel fuel, motor oil, hydraulic fluid, solvents, cleaners, sealants, welding flux, various lubricants, paint, and paint thinner. The quantities of hazardous materials that will be onsite during construction are small, relative to the quantities used during operation. Several hazardous materials, including two regulated substances (aqueous ammonia and hydrogen), will be stored at the generating site during operation. Only aqueous ammonia will be stored in amounts above the threshold quantity during the operations phase and a Risk Management Plan will be prepared consistent with the California's Accidental Release Prevention Program requirements. Sufficient monitoring will be performed during the construction and operation phases to ensure that the proposed mitigation measures are satisfied and that they are effective in mitigating any potential environmental effects.

An offsite consequence analysis was performed to assess the risk to humans from the plant if a spill or rupture of the aqueous ammonia storage tank or truck delivery tank were to occur. Based on this conservative modeling analysis, the worst-case accident is not expected to result in an offsite ammonia concentration greater than 75 parts per million (ppm). Since the general public will not be exposed to ammonia concentrations above 75 ppm during a worst-case release scenario, its onsite storage will not pose a significant risk to the public.

1.7.13 Waste Management

During construction, the primary waste generated will be solid nonhazardous waste. However, some nonhazardous liquid waste and hazardous waste (solid and liquid) will also be generated. Most of the hazardous wastes will be generated at the plant site, but a minimal quantity of hazardous waste will be generated during construction of the project linears. The types of waste and their estimated quantities are described in the Waste Management subsection. The primary waste generated during the operation phase will be nonhazardous wastewater. Other nonhazardous solid waste will also be generated, as well as varying quantities of liquid and solid hazardous waste. Handling and mitigation of these wastes is also described in the Waste Management subsection.

The handling and management of waste generated by the project will follow the hierarchical approach of source reduction, recycling, treatment, and disposal. The first priority will be to reduce the quantity of waste generated through pollution prevention methods (e.g., high-efficiency cleaning methods). The next level of waste management will involve the reuse or recycling of wastes (e.g., used oil recycling). For wastes that cannot be recycled, treatment will be used, if possible, to make the waste nonhazardous (e.g., neutralization). Finally, offsite disposal will be used to dispose of residual wastes that cannot be reused, recycled, or treated.

1.7.14 Water Resources

CCR Title 22 reclaimed water will be used for the CECP's process, evaporative cooling water, and miscellaneous plant uses (e.g., equipment wash water), and on-site irrigation will be supplied by the City of Carlsbad Water Recycling Facility. It is estimated that 536 acre-feet of water per year will be required. Use of reclaimed water conserves higher quality groundwater for potable water and other critical uses.

Potable water will be supplied to the CECP site by the City of Carlsbad. Potable water will be supplied through the existing water supply infrastructure and will be used for domestic purposes, for fire protection, and as an emergency water supply for the project. A backup connection will allow potable water to be used for plant makeup in the event that reclaimed water is not available. This connection will be equipped with an approved back-flow preventer.

Proposed mitigation measures are prescribed by storm water and erosion control management programs mandated under National Pollutant Discharge Elimination System (NPDES) permits applicable to municipal, construction and industrial discharges. These programs have been in place for a number of years and have specific technical standards applicable to water quality controls implemented to meet permit requirements. Under the General NPDES Permit for Construction, for example, various specific measures are prescribed, and a program of monitoring is required. Compliance with these programs should ensure that all residual impacts associated with the project are mitigated to a level of less than significant. See Section 5.15 for details on the project analysis for effects on water resources.

1.7.15 Geologic Hazards and Resources

The most significant potential geologic hazard that could affect the project is seismic ground shaking. A strong earthquake from either the Newport-Inglewood or Rose Canyon faults could cause peak ground acceleration up to 0.27g. This potential impact will be mitigated by ensuring that the project is constructed to California Building Commission standards for seismic zone 4. Construction to this standard will minimize impacts to the project from design-basis earthquakes and be protective of life and property. Other geologic hazards that were evaluated during the assessment of the project site included: Ground Rupture; Liquefaction; Mass Wasting; Subsidence; Expansive Soils; and Tsunami/Seiches. Based on the review of available data, it was determined that the potential for these hazards to affect the site were low.

There were no geologic resources of recreational, commercial, or recreational value identified during the evaluation of this project site. See Section 5.4 for details about the project analysis of geological hazards and potential impacts on geologic resources.

1.7.16 Paleontological Resources

A detailed analysis of potential effects of the CECP on paleontological resources was completed. The analysis considered the potential for sediments within the area of potential effect to contain significant fossil remains that could be disturbed during earth moving activities associated with construction of the CECP and associated linear features. The analysis was based on a review of available information that included geological maps,

satellite and aerial photographs, technical and scientific reports, and recent assessments of subsurface conditions in relevant environmental documents. This resource document review was supplemented with a reconnaissance-level field review by a project paleontological resources specialist (PRS). The analysis concludes that impacts to paleontological resources could occur during subsurface excavations associated with the construction of the CECP and associated linear features. In particular, any excavations extending below the artificial fill (i.e., deeper than 2 feet below ground surface) that were completed without mitigation could result in adverse effect. However, given the proposed application of paleontological monitoring and mitigation measures on the CECP and other projects in the vicinity, the anticipated project or cumulative effects are negligible. See Section 5.8 for details concerning the analysis of potential CECP impacts to paleontological resources.

1.8 Key Benefits

1.8.1 Environmental

The CECP will employ advanced, fast start, high-efficiency combustion turbine technology along with SCR and oxidation catalyst to minimize emissions from the facility during operation. With its exclusive use of natural gas for fuel and with its extremely fast startup duration, the project will be among the cleanest facilities of comparable size in the nation. With the contemporaneous shutdown of Encina Power Station Units 1-3, the CECP will create sufficient emission offsets to more than compensate for the project's maximum potential air emissions. Further, the retirement of Units 1-3 and the use of air cooled condensers for the CECP will eliminate 225 million gallons per day of seawater cooling pump capacity, which will reduce the impingement and entrainment rates of marine life at the existing Encina Power Station.

The project will also minimize freshwater use and all project wastewater discharge will go to the sewer system. CCR Title 22 reclaimed water from the City of Carlsbad will be used for project raw and process water needs. The former use of potable water for supplying raw water to Units 1-3 will also cease when those units are retired and all discharge of wastewaters to the ocean from Encina Units 1-3 will be eliminated.

1.8.2 Employment

The project will provide for a peak of approximately 366 construction jobs, with an average of almost 254 construction jobs, over the 19 to 25 month construction period depending on which construction schedule option is implemented (Single Phase Construction or Phased Construction). The project will be operated by the existing 50 person workforce at the Encina Power Station and will continue to provide full-time, living-wage jobs in San Diego County.

1.8.3 Energy Efficiency

The CECP will be an efficient, environmentally-responsible source of economic and reliable energy to meet the energy demands of the SDG&E service territory and assist the State in developing increased local generation projects. Each unit combines the fast starting capability of a simple cycle gas turbine and the efficiency of a combined cycle plant in a

cost-effective design. Each unit is designed to start and ramp up to 150 MW in ten minutes and still be capable of operating with combined-cycle efficiency. The fast-start capability is a requirement for peaking applications and has the additional benefit of reducing start-up emissions compared to a conventional combined cycle plant.

1.9 Persons Who Prepared the AFC

Persons with primary responsibility for the preparation of each section of this AFC are listed in Appendix 1B.

1.10 Laws, Ordinances, Regulations, and Standards

Each section addresses the relevant LORS and addresses compliance with them.

1.11 Permitting Requirements

Each section provides a list of applicable federal, state, and local permits that would be required by each jurisdiction for the project.

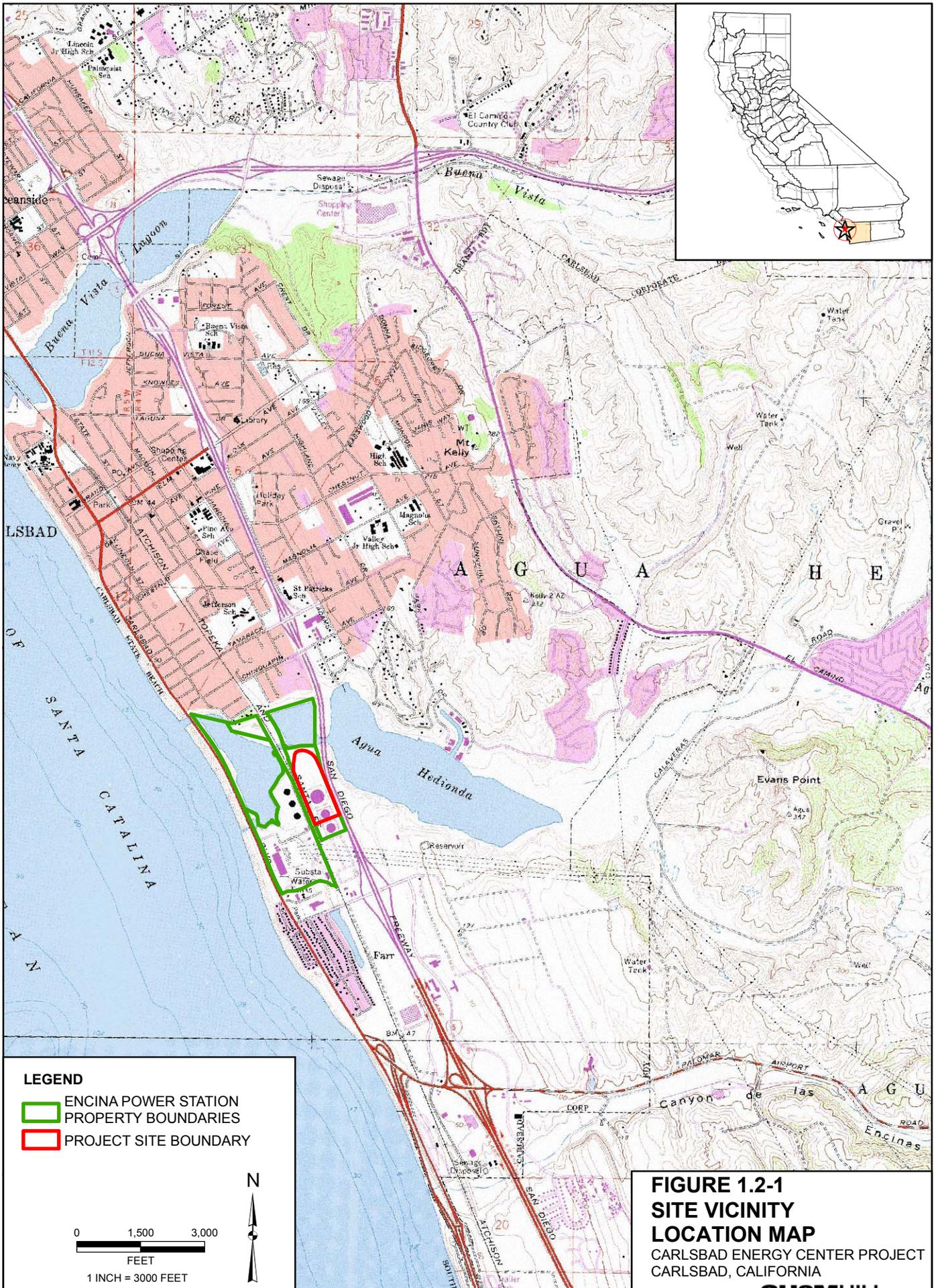


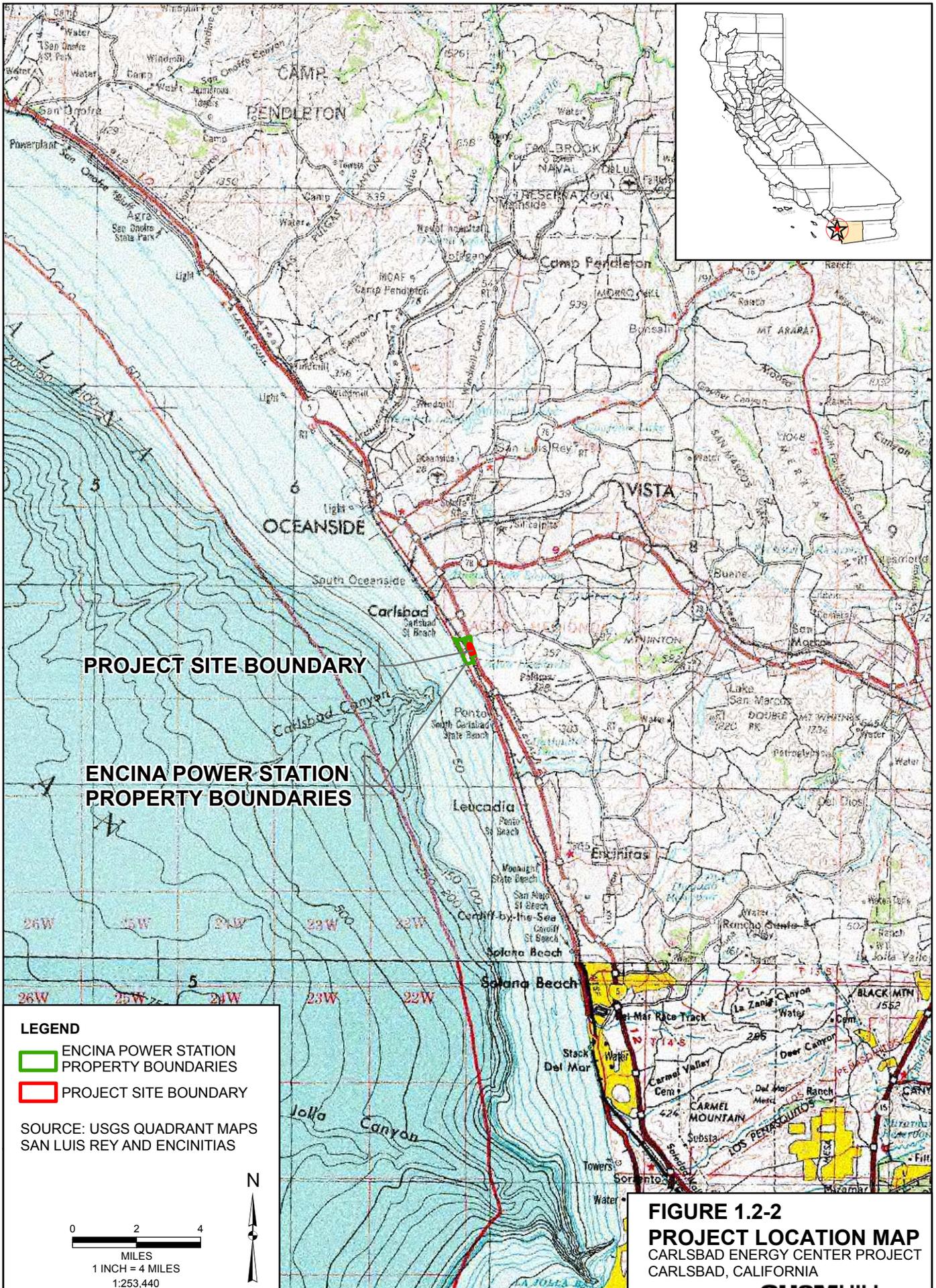
FIGURE 1.2-1
SITE VICINITY
LOCATION MAP
 CARLSBAD ENERGY CENTER PROJECT
 CARLSBAD, CALIFORNIA

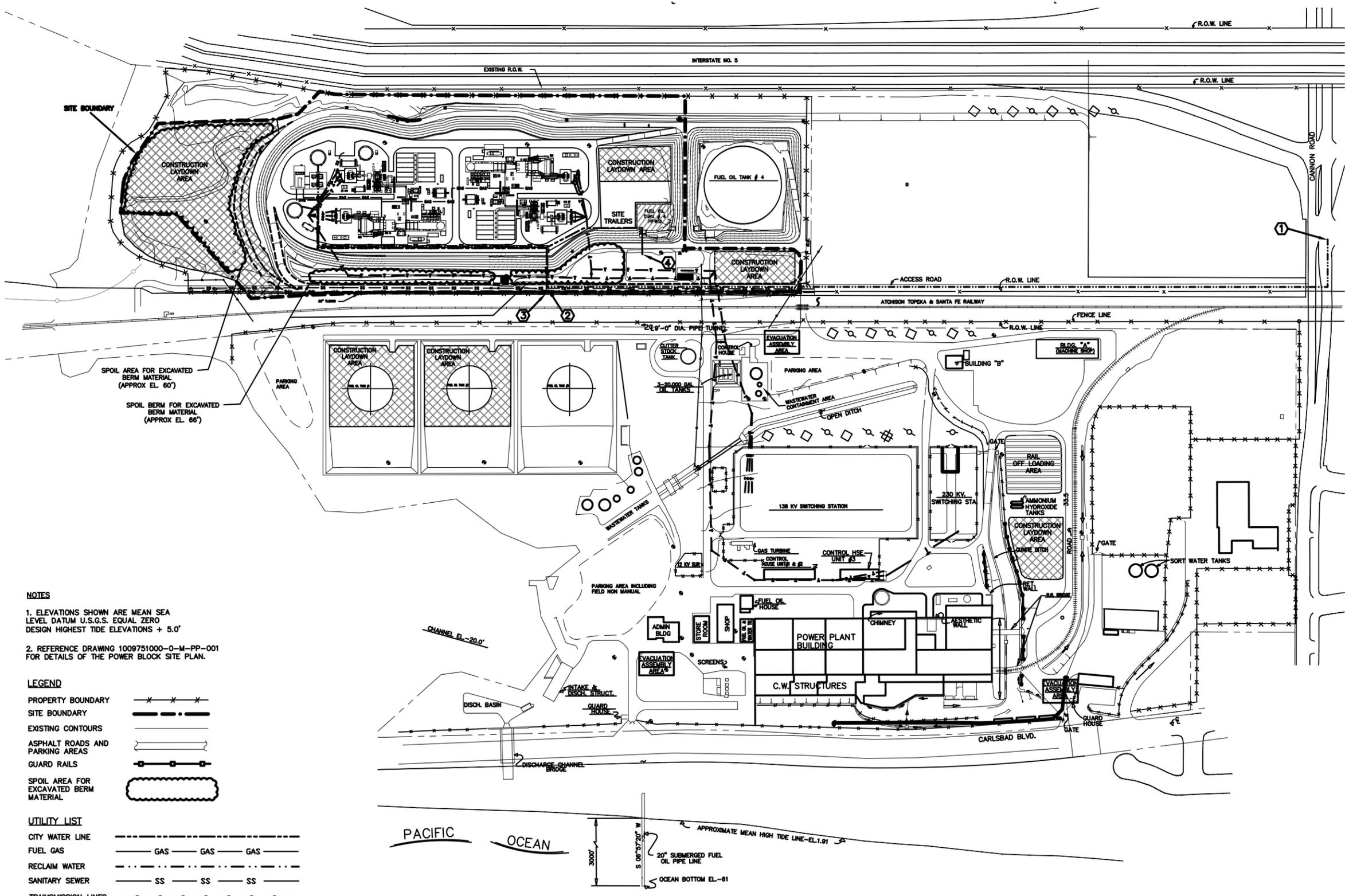
LEGEND

- ENCINA POWER STATION
- PROPERTY BOUNDARIES
- PROJECT SITE BOUNDARY

N

0 1,500 3,000
 FEET
 1 INCH = 3000 FEET





NOTES

- ELEVATIONS SHOWN ARE MEAN SEA LEVEL DATUM U.S.G.S. EQUAL ZERO DESIGN HIGHEST TIDE ELEVATIONS + 5.0'
- REFERENCE DRAWING 1009751000-0-M-PP-001 FOR DETAILS OF THE POWER BLOCK SITE PLAN.

LEGEND

PROPERTY BOUNDARY: -x-x-x-

SITE BOUNDARY: - - - - -

EXISTING CONTOURS: - - - - -

ASPHALT ROADS AND PARKING AREAS: - - - - -

GUARD RAILS: -o-o-o-

SPOIL AREA FOR EXCAVATED BERM MATERIAL: [wavy line symbol]

UTILITY LIST

CITY WATER LINE: - - - - -

FUEL GAS: - GAS - GAS - GAS -

RECLAIM WATER: - - - - -

SANITARY SEWER: - SS - SS - SS -

TRANSMISSION LINES: - - - - -

TIE POINTS

① RECLAIM WATER

② SANITARY SEWER

③ FUEL GAS

④ CITY WATER

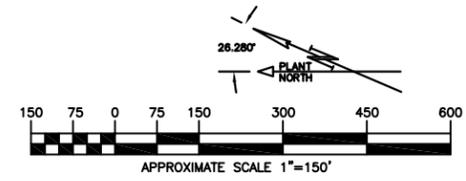


FIGURE 1.2-3
CECP PLOT PLAN
 CARLSBAD ENERGY CENTER PROJECT
 CARLSBAD, CALIFORNIA

Source: Shaw Stone & Webster, Inc.



Existing View from Encina Power Station turbine building

NOTE: Three of the existing tanks will be demolished as part of ongoing operations and maintenance of the Encina Power Station.



Visual Simulation of Proposed Project

For viewpoint location refer to Figure 5.13-3 Viewpoint 1

Source: Environmental Vision

FIGURE 1.3-1
PROJECT SITE APPEARANCE
EXISTING VIEW AND VISUAL SIMULATION
 CARLSBAD ENERGY CENTER PROJECT
 CARLSBAD, CALIFORNIA

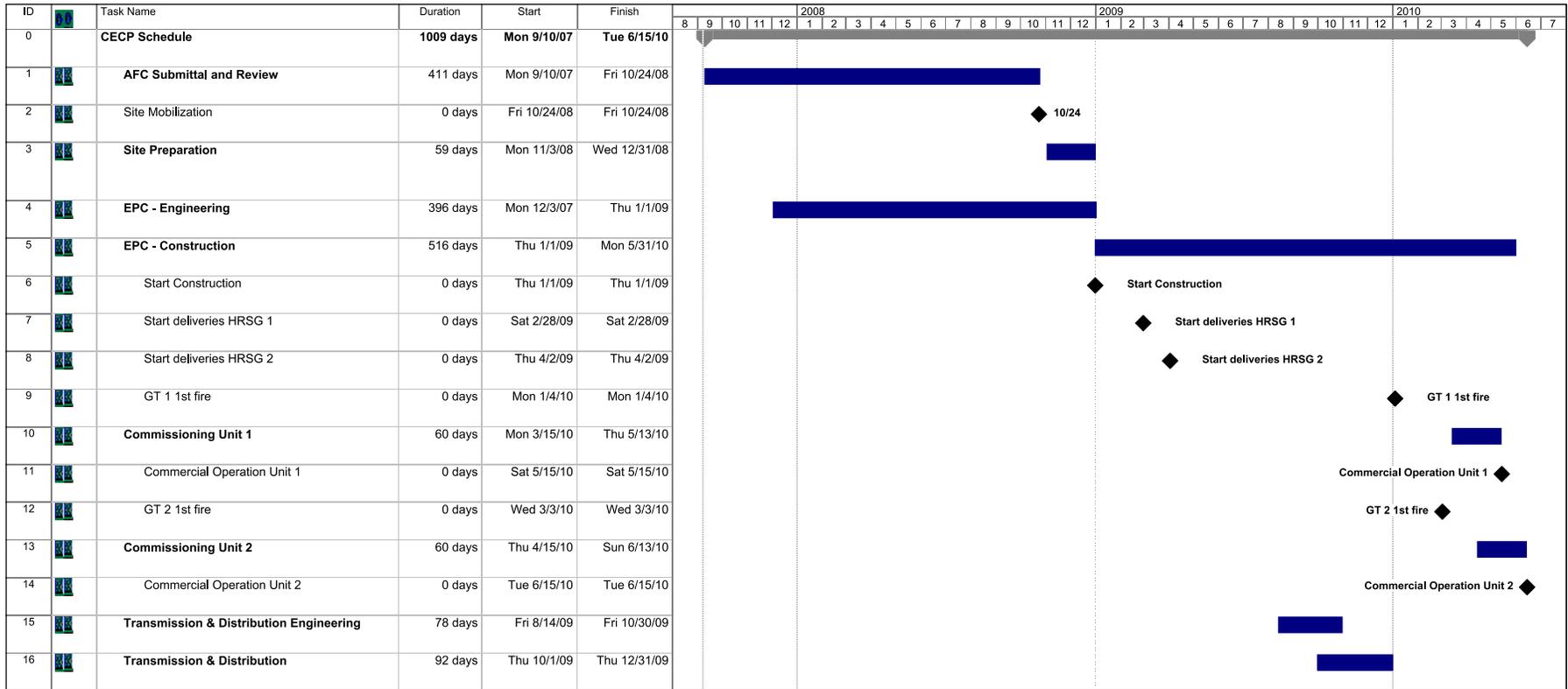


FIGURE 1.4a
SINGLE PHASE PROJECT
SCHEDULE
 CARLSBAD ENERGY CENTER PROJECT
 CARLSBAD, CALIFORNIA

Source: Shaw Stone & Webster, Inc.

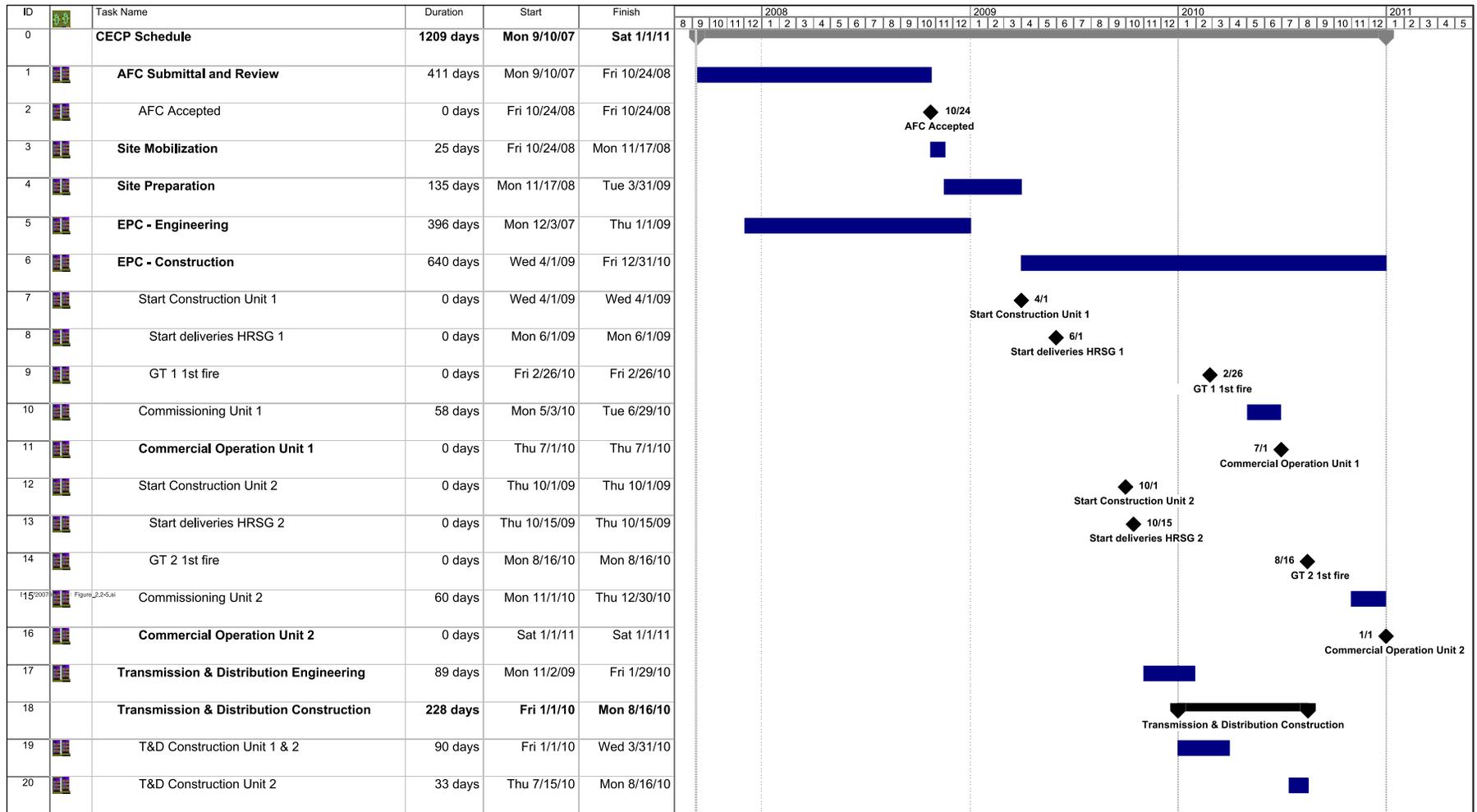


FIGURE 1.4b
PHASED CONSTRUCTION
PROJECT SCHEDULE
 CARLSBAD ENERGY CENTER PROJECT
 CARLSBAD, CALIFORNIA

Source: Shaw Stone & Webster, Inc.