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Docket Number:	13-AFC-01
Project Title:	Alamitos Energy Center
TN #:	201620-6
Document Title:	AEC AFC 1.0 Executive Summary
Description:	Previously TN# 201495-5
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Organization:	CH2M Hill
Submitter Role:	Applicant Consultant
Submission Date:	2/3/2014 12:47:11 PM
Docketed Date:	2/3/2014

Executive Summary

1.1 Project Overview

AES Southland Development, LLC (AES-SLD) proposes to construct, own, and operate the Alamos Energy Center (AEC)—a natural-gas-fired, air-cooled, combined-cycle, electrical generating facility in Long Beach, Los Angeles County, California. The proposed AEC will have a net generating capacity of 1,936 megawatts (MW) and gross generating capacity of 1,995 MW.¹ The AEC will replace and be constructed on the site of the existing Alamos Generating Station.

The AEC will reuse the existing, 63-acre, brownfield, Alamos Generating Station power plant site and existing infrastructure including the existing Southern California Edison (SCE) switchyard and transmission facilities; connections to the Southern California Gas Company (SoCalGas) natural gas pipeline system and City of Long Beach Water Department (LBWD) potable water connections; process water supply lines; existing fire suppression and emergency services facilities; and the administration, maintenance, and certain warehouse buildings. The AEC will replace ocean water once-through cooling (OTC) with dry cooling to comply with the California State Water Resources Control Board's (SWRCB) *Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling* (OTC Policy) and consistent with the California Independent System Operator (CAISO) 2011-2012 Transmission Plan (SWRCB, 2010; CAISO, 2012a).

The construction and operation of the AEC along with the demolition of existing facilities will provide significant, well-paying, high-quality jobs. At its peak, the AEC will employ approximately 447 workers and, on average, 146 workers over the approximately 139-month construction and demolition period (approximately 4.67 million person hours of new employment opportunities). With an estimated \$401.5 million in construction and demolition payroll, these new jobs will be at an average hourly rate of \$85.90 per hour, including benefits. The estimated value of materials and supplies purchased locally in Los Angeles County during construction and demolition is \$89.79 million. The AEC will add an estimated 32 indirect and 188 induced jobs in Los Angeles County, adding an additional \$7.75 million in annual local construction expenditures and \$21.84 million in annual spending by local construction workers. With an estimated average of 51 full-time employees for operations, the AEC's approximate operation payroll, including benefits, will be \$6,331,000 per year. There will also be an annual operations and maintenance budget of approximately \$8,312,000, to be spent locally within Los Angeles County.

In terms of ensuring electric reliability, the California Independent System Operator (CAISO) and the California Energy Commission (CEC) have recognized the importance of the Alamos Generating Station location as part of the coastal OTC fleet that provides both energy and capacity to satisfy the western Los Angeles Basin Local Reliability Area requirements (CAISO, 2011). The CAISO has identified a need for power generation facilities in the western sub-area of the Los Angeles Basin Local Reliability Area to replace the ocean water OTC plants that are expected to retire as a result of the SWRCB's OTC Policy (CAISO, 2012a; SWRCB, 2010). The results from the CAISO's year 2021 long-term Local Capacity Requirements study estimates that between 2,370 and 3,741 MW² of replacement OTC generation is required in the Los Angeles Basin to meet the future needs of the area. The requirement for replacement generation in light of OTC retirements in the Los Angeles Basin, along with other long-term transmission planning assumptions, is also

¹ Referenced to site ambient average temperature conditions of 65.3 degrees Fahrenheit (°F) dry bulb and 62.7°F wet bulb temperature without evaporative cooler operation.

² This range of OTC replacement capacity corresponds to the CAISO "Trajectory" planning scenario, which has been defined as the most likely planning scenario.

confirmed in CAISO's *Once-Through Cooling and AB-1318 Study Results* presented on December 8, 2011 (CAISO, 2011). CAISO also notes that many of the OTC facilities are in locations critical to local electrical reliability and repowered or replacement generating capacity with characteristics that support renewable integration in these same locations would provide both local capacity for reliability and essential grid support for a future with ever increasing amounts of variable renewable energy. The effect of the repower/replacement OTC facilities reduces the number of total megawatts required compared to new generation developed elsewhere (CAISO, 2012b).

The California Public Utilities Commission (CPUC) confirmed the need for new generation in the Los Angeles Basin in a decision authorizing procurement of between 1,400 and 1,800 MW of new electrical capacity in the western Los Angeles sub-area to meet long-term local capacity requirements by 2021 and that at least 1,000 MW but no more than 1,200 MW must be from conventional gas-fired resources (including combined heat and power resources). Further, the CPUC found the following: a significant need for local generating resources to replace retiring OTC plants in the Los Angeles Basin local area under every scenario analyzed by the CAISO; that a significant amount of the 1,400 to 1,800 MW procurement be met through conventional gas-fired resources in order to ensure local capacity reliability needs are met; and that gas-fired resources at current OTC sites meet CAISO's criteria for meeting local generating needs but other resources can also meet or reduce the local generating needs but may not be as effective (CPUC, 2013). As a modern, gas-fired generation plant located at an existing OTC site, the AEC will satisfy these resource and reliability needs.

The AEC will consist of four 3-on-1 combined-cycle gas turbine power blocks with twelve natural-gas-fired combustion turbine generators, twelve heat recovery steam generators, four steam turbine generators, four air-cooled condensers, and related ancillary equipment. The AEC will use air-cooled condensers for cooling, completely eliminating the existing ocean water OTC system. The AEC will use potable water provided by the LBWD for construction, operational process, and sanitary uses but at substantially lower volumes than the existing Alamitos Generating Station has historically used. This water will be supplied through existing onsite potable water lines.

The AEC will interconnect to the existing SCE 230-kilovolt switchyard adjacent to the north side of the property. Natural gas will be supplied to the AEC via the existing offsite 30-inch-diameter pipeline owned and operated by SoCalGas that currently serves the Alamitos Generating Station. Existing water treatment facilities, emergency services, and administration and maintenance buildings will be reused for the AEC. The AEC will require relocation of the natural gas metering facilities and construction of a new natural gas compressor building within the existing Alamitos Generating Station site footprint. Stormwater will be discharged to two retention basins and then ultimately to the San Gabriel River via existing stormwater outfalls.

The AEC will include a new 1,000-foot process/sanitary wastewater pipeline to the first point of interconnection with the existing LBWD sewer system and will eliminate the current practice of treatment and discharge of process/sanitary wastewater to the San Gabriel River. The project may also require upgrading approximately 4,000 feet of the existing offsite LBWD sewer line downstream of the first point of interconnection, therefore, this possible offsite improvement to the LBWD system is also analyzed in this Application for Certification (AFC). The total length of the new pipeline (1,000 feet) and the upgraded pipeline (4,000 feet) is approximately 5,000 feet.

To provide fast-starting and stopping, flexible generating resources, the AEC will be configured and deployed as a multi-stage generating (MSG) facility. The MSG configuration will allow the AEC to generate power across a wide and flexible operating range. The AEC can serve both peak and intermediate loads with the added capabilities of rapid startup, significant turndown capability (ability to turn down to a low load), and fast ramp rates (30 percent per minute when operating above minimum gas turbine turndown capacity). As California's intermittent renewable energy portfolio continues to grow, operating in either load following or partial shutdown mode will become necessary to maintain electrical grid reliability, thus placing an

increased importance upon the rapid startup, high turndown, steep ramp rate, and superior heat rate of the MSG configuration employed at the AEC.

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

The AEC's combustion turbines and associated equipment will include the use of best available control technology to limit emissions of criteria pollutants and hazardous air pollutants. By being able to deliver flexible operating characteristics across a wide range of generating capacity, at a relatively consistent and superior heat rate, the AEC will help lower the overall greenhouse gas emissions resulting from electrical generation in southern California and allow for smoother integration of intermittent renewable resources.

Existing Alamitos Generating Station Units 1–6 are currently in operation. All six operating units and retired Unit 7 will be demolished as part of the proposed project. Construction and demolition activities at the project site are anticipated to last 139 months, from first quarter 2016 until third quarter 2027. The project will commence with the demolition of retired Unit 7 and other ancillary structures to make room for the construction of AEC Blocks 1 and 2. The demolition of Unit 7 will commence in the first quarter of 2016. The construction of Block 1 is scheduled to commence in the third quarter of 2016 and construction of Block 2 is scheduled to commence in the fourth quarter of 2016. The demolition of existing Units 5 and 6 will make space for the construction of AEC Block 3. AEC Block 3 construction is scheduled to commence in the first quarter of 2020 and will be completed in the second quarter of 2022. The demolition of existing Units 3 and 4 will make space for the construction of AEC Block 4. AEC Block 4 construction is scheduled to commence in the second quarter of 2023 and will be completed in the fourth quarter of 2025. The demolition of remaining existing units is scheduled to commence in the third quarter of 2025.

Construction of the AEC will require the use of onsite laydown areas (approximately 8 acres dispersed throughout the existing site) and an approximately 10-acre laydown area located adjacent to the existing site. The adjacent 10-acre laydown area will be shared with another project being developed by the Applicant (Huntington Beach Energy Project [HBEP] 12-AFC-02). Due to the timing for commencement of construction for these two projects, the adjacent laydown area will already be in use for equipment storage before AEC construction begins.

The AEC is the most efficient and effective design with the least environmental effects to meet the needs of the electrical system. Although the AES-SLD is not required to consider offsite alternatives (Public Resources Code 25540.6), alternative technologies were considered that have the potential to reduce environmental impacts and feasibly attain the project objectives. Alternative generating technologies including conventional boiler and steam turbine, simple-cycle combustion turbine, wind energy, photovoltaic and solar thermal technologies, Kalina combined cycle, internal combustion engines and energy storage were considered but rejected due to the inability of these technologies to provide generating capacity for local reliability needs, meet peak energy demands, and provide flexible generation with minimum environmental effects. Alternative equipment technologies were also considered but were rejected because of their environmental effects or their inability to meet the project objectives.

The Assessor's Parcel Numbers for the Alamitos Energy Center site are 7237-017-805, 7237-017-806, 7237-017-807, 7237-017-808, 7237-017-809, 7237-018-807, 7237-018-808, and 7237-019-808. Appendix 1A provides the legal description and title report for the site. The site is located in Township 5 south, Range 12 west, section 2 and Township 5 south, Range 12 west, section 11, Los Alamitos quad. Appendix 1B provides a list of the property owners located within 1,000 feet of the project site.

Figure 1.1-1 is an artistic rendering of the project, Figure 1.1-2 shows the location of the project within the Los Angeles County region, Figure 1.1-3 shows the site location, and Figure 1.1-4 is a photograph of the existing site.

1.2 Project Objectives

The primary project objective is to replace the existing Alamitos Generating Station power plant with a modern, state-of-the-art, efficient, fast-starting, combined-cycle natural gas power plant and that satisfies the requirements of the South Coast Air Quality Management District's Rule 1304(a)(2), the AEC. Related project objectives are to:

- Reuse the existing brownfield, power plant site and existing infrastructure, including the existing Alamitos Generating Station switchyard and related facilities, the SCE switchyard and transmission facilities, the SoCalGas natural gas pipeline system, the LBWD potable water connections, process water supply lines, existing fire suppression and emergency services facilities, and the administration, maintenance and certain warehouse buildings.
- Replace ocean water OTC with dry cooling to comply with the SWRCB's OTC Policy (CAISO, 2012a; SWRCB, 2010).
- Provide fast starting and stopping, flexible, controllable generation with the ability ramp up and down through a wide range of electrical output to allow the integration of the renewable energy into the electrical grid in satisfaction of California's Renewable Portfolio Standard (RPS), displacing older and less efficient generation.

1.3 Project Owner

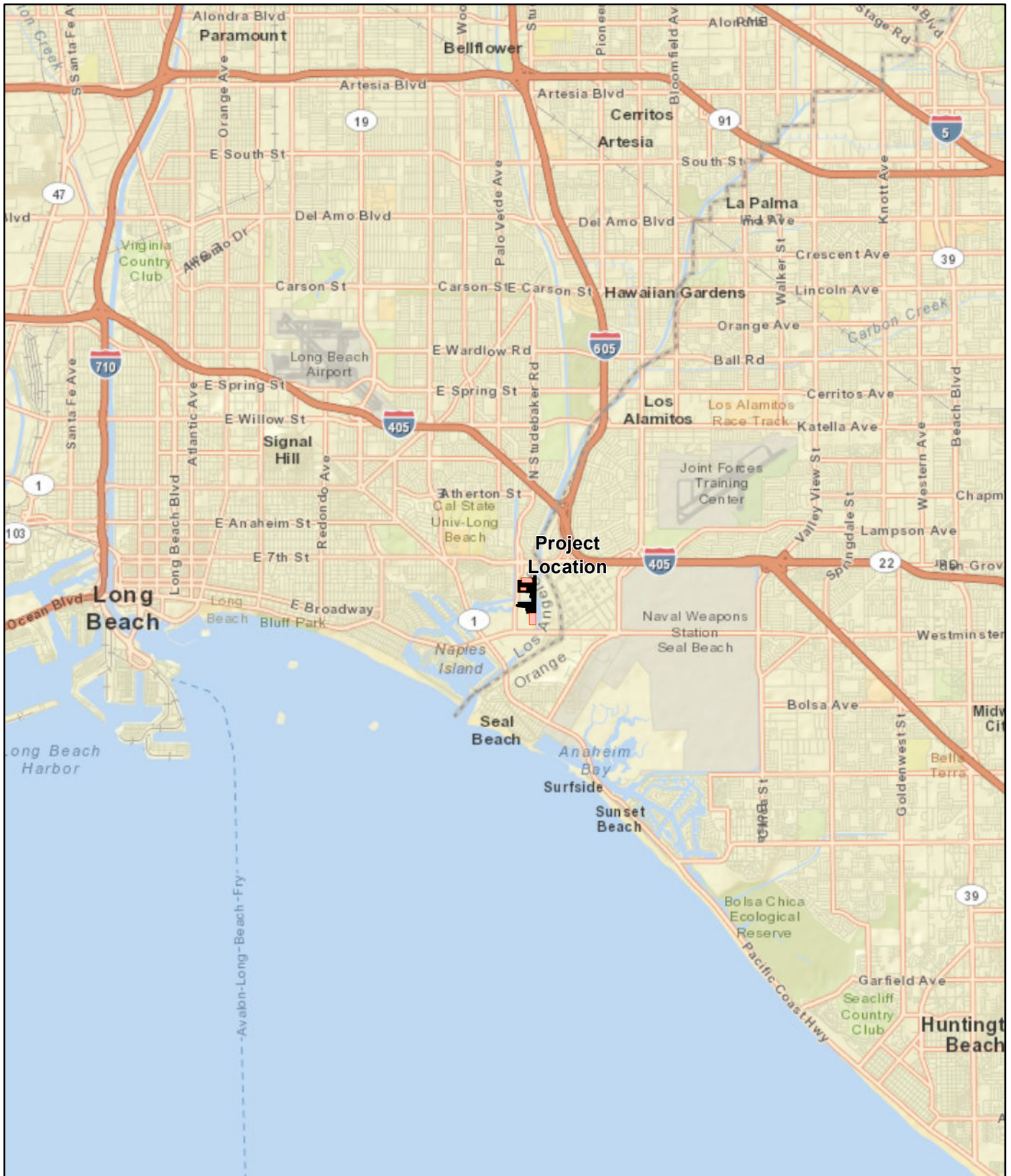
The AEC project owner is AES-SLD, a wholly owned subsidiary of the AES Corporation. The AES Corporation is a global power company with generation and distribution businesses across five continents. Founded in 1981, the AES Corporation built its first power plant in 1985, followed shortly thereafter by the AES Placerita plant in Newhall, California. Since 1989, AES has owned and operated both renewable energy and natural gas generating plants in California. Today, through its portfolio of thermal and renewable fuel sources, the AES Corporation safely provides affordable and sustainable energy in 21 countries. In California, the AES Corporation generates enough electricity from both thermal and renewable sources to power millions of homes and businesses. The AES Corporation brings the combined expertise of a global force of approximately 25,000 people.

1.4 Project Schedule

Construction of the generating facility, from final engineering design and planning to commercial operation date, including completion of all demolition, is expected to take place from the first quarter of 2016 to the third quarter of 2027. Actual onsite physical construction and demolition from site preparation to completion of all mechanical, electrical, and balance of plant equipment and demolition of Alamitos Generating Station Units 1–6 is expected to take approximately 139 months. Major project milestones are listed in Table 1.4-1.



FIGURE 1.1-1
Artist Rendering
Alamos Energy Center
November 2013



Legend

- Project Boundary
- Parking/Laydown Construction Area

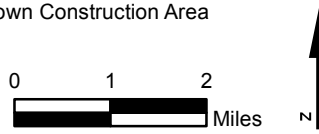


FIGURE 1.1-2
Regional Location Map
 Alamos Energy Center
 Long Beach, California



Legend

- Project Boundary
 - Parking/Laydown Construction Area
 - Proposed New Process/
Sanitary Wastewater Pipeline to First Point of Interconnection
 - Upgraded Sewer Pipeline
- 0 1,000 2,000
 Feet



FIGURE 1.1-3
Site Location Map
 Alamitos Energy Center
 Long Beach, California



FIGURE 1.1-4
Photograph of the Existing Site
Alamos Energy Center
Long Beach, California

TABLE 1.4-1
AEC Schedule Major Milestones

Activity	Commence Activity	Commercial Operation
Begin Demolition of Alamitos Generating Station Unit 7	First Quarter 2016	NA
Begin Construction of Block 1	Third Quarter 2016	Second Quarter 2019
Begin Construction of Block 2	Fourth Quarter 2016	Second Quarter 2019
Begin Demolition of Alamitos Generating Station Units 5&6	Fourth Quarter 2018	NA
Begin Construction of Block 3	First Quarter 2020	Third Quarter 2022
Begin Demolition of Alamitos Generating Station Units 3&4	First Quarter 2022	NA
Begin Construction of AEC Block 4	Second Quarter 2023	Fourth Quarter 2025
Begin Demolition of Alamitos Generating Station Units 1&2	Third Quarter 2025	NA

As noted in Table 1.4-1, demolition of the existing Alamitos Generating Station (as described in Section 2.3) will occur throughout the construction period of the AEC.

1.5 Project Alternatives

A review of project alternatives was conducted to identify reasonable alternatives to the AEC that could feasibly attain most of the project objectives and reduce or eliminate any significant effects of the project. The primary objectives of the AEC are discussed in Section 1.2. The project alternatives analysis included the “no project” alternative, project design alternatives, and technology alternatives.

As a matter of law, the AEC is not required to consider offsite alternatives. Public Resources Code Section 25540.6(b) states: “The commission may also accept an application for a non-cogeneration project at an existing industrial site without requiring a discussion of site alternatives if the commission finds that the project has a strong relationship to the existing industrial site and that it is therefore reasonable not to analyze alternative sites for the project.” The AEC has a strong relationship to the existing industrial site, as a power plant has been located on this site for nearly 60 years. The proposed AEC project will use the existing infrastructure and ancillary facilities of an existing power plant, on a site zoned for a power plant, at a location that has been used for a power plant for nearly 6 decades. The primary objective of the AEC project is to replace the existing Alamitos Generating Station conventional steam boiler technology power plant with the AEC—a modern, state-of-the-art, efficient, fast-starting, combined-cycle natural gas power plant that uses the existing brownfield, power plant site and existing infrastructure. Therefore, in enacting Public Resources Code Section 25540.6, the Legislature determined that it is reasonable not to analyze offsite alternatives for projects with such a strong relationship to an existing industrial site.

Under the no project alternative, the AEC would not be built and the associated benefits of the AEC would not materialize. The existing Alamitos Generating Station would remain in place. To comply with the SWRCB’s OTC policy, the existing Alamitos Generating Station would either: (1) replace the OTC cooling system at the Alamitos Generating Station with a closed-loop cooling system, (2) employ other engineered solutions to reduce impingement and entrainment of marine life through the OTC system per the SWRCB’s OTC policy, or (3) cease operations. Other potential alternative means of complying with the SWRCB’s OTC policy are discussed in Section 6.7.2.

If the Alamitos Generating Station were to cease operations, the Alamitos Generating Station would drain, remove, and appropriately dispose of certain materials. In terms of actions to dismantle facilities, remove equipment, and remediate the site, AES-SLD would follow the same laws applicable to other private development in Long Beach. As discussed in Section 6.0, the no project alternative and cessation of Alamitos

Generating Station were rejected in favor of the proposed AEC project due, in part, to engineering constraints, or environmental and economic impacts. Based on CAISO's 2021 projection and the CPUC finding of the need for OTC replacement generation, decommissioning existing OTC facilities without adequate replacement generation could create reliability concerns. The no project alternative would not be preferable because of the need for economical, reliable, and environmentally sound generation resources in the region. The no project alternative would not meet the basic project objectives, would eliminate the proposed project's benefits, and would not avoid potential significant impacts. The proposed AEC project does not result in any significant impacts, therefore, the no project alternative was rejected in favor of the AEC.

The AEC will be located within the boundaries of the existing Alamitos Generating Station site, will reuse existing infrastructure and facilities, and thus has a strong relationship to the existing industrial site (Public Resources Code Sections 25540.6(a)(2) and (b)). The AEC will provide the same electrical service from the same location as the existing Alamitos Generating Station, using existing infrastructure, including the existing high-voltage electric transmission interconnection point, potable water pipelines, and natural gas pipeline that serve the existing facility. The proposed offsite wastewater pipeline could be viewed as a benefit because inclusion of this project feature eliminates the discharge of sanitary and process wastewater to the San Gabriel River and ultimately to the Pacific Ocean. Relocating or duplicating the electrical interconnection and associated transmission system to support an alternative location in this densely populated and highly urbanized area would not be feasible. The transmission system that serves the western Los Angeles Basin was designed, built, and subsequently expanded around the existing power plant locations as the area became further urbanized and more densely populated. The proposed project has been designed to fit within the existing electrical system and serve the current and future needs of the urban development which now constrains further expansion, replacement or relocation of the existing electrical transmission and distribution system.

Given the strong relationship to the existing industrial site, the AEC is exempt from further offsite alternatives analyses. Moreover, as shown in the environmental analysis of the project, the AEC has mitigated potentially significant impacts to a level below significance thus leaving no need to analyze alternative sites which could reduce impacts. Alternative sites would fail to obtain most of the project objectives, especially the objectives of modernization and reuse of existing infrastructure. Moreover, given the substantial urban development that has grown up around the AEC project site, any offsite alternatives would almost certainly have their own potential to have significant impacts and non-compliance with applicable laws, ordinances, regulations, and standards (LORS), including potential inconsistency with local coastal development plans. For these primary reasons, a suitable brownfield site could not be identified with the combination of existing infrastructure and the potential of fewer environmental impacts than those identified for the AEC.

The AEC will connect to the exiting natural gas supply pipeline and the existing SCE electrical system, complying with applicable LORS and avoiding any new potential impacts, so no design alternatives are required for those facilities.

A number of water supply alternatives were reviewed. Fresh water demand at the AEC is proposed to be provided by the LBWD. Potential alternative water supply sources for the AEC include ocean water from the Pacific Ocean and secondary or tertiary treated wastewater. After further review, these alternative water supply sources would create additional environmental impacts and be more costly due to the need for construction of additional infrastructure. Therefore, use of the potable water system provided by the LBWD is the preferred source of water for the AEC.

Several technology alternatives were also reviewed in a process that resulted in the selection of a configuration of commercially proven technology in a combined-cycle gas turbine power plant for the AEC. The technology alternatives included generation technology alternatives, power plant cooling alternatives, fuel technology alternatives, nitrogen oxide (NO_x) control alternatives, energy storage alternatives, and

waste discharge alternatives. None of these technologies was considered equal or superior to the combined-cycle turbine technology selected for the AEC in reliability, availability and/or use of resources, cost effectiveness or meeting the basic objectives of the project.

A comprehensive review of alternatives to the AEC technology, project design, location, and the no project alternative are presented in Section 6.0.

1.6 Environmental Considerations

Pursuant to the requirements set forth in existing environmental laws and the CEC's regulations, 16 environmental disciplines with possible associated environmental impacts that could result from the proposed AEC were investigated. Detailed descriptions and analyses of these areas are presented in Sections 5.1 through 5.16 of this AFC. As discussed in detail in this AFC, with the implementation of the proposed mitigation measures and the anticipated CEC's Conditions of Certification, there will be no significant unmitigated environmental impacts associated with AEC construction and operation.

As a modern, combined-cycle facility, the AEC will have lower emission rates on a kilowatt-hour production basis, with greater thermal efficiency, lower greenhouse gas emissions, and lower criteria pollutant emissions. Furthermore, the AEC will eliminate the use of ocean water by the Alamitos Generating Station by eliminating OTC and avoiding the impingement and entrainment impacts of the existing facility. In general, as a brownfield site devoid of significant biological resources, the AEC addresses and minimizes a host of potential environmental impacts in nearly every discipline analyzed in this AFC.

This executive summary highlights findings related to five subject areas that have historically been of interest in CEC proceedings: air quality, biological resources, noise, visual resources, and water resources.

1.6.1 Air Quality

The AEC site is located in an area designated as non-attainment for state and federal ozone, for the state nitrogen dioxide (NO₂) PM₁₀ and PM_{2.5} standards, and is designated as federal maintenance and non-attainment for PM₁₀ and PM_{2.5} standards, respectively.

An assessment of project impacts on air quality was conducted using a comprehensive, numerical air dispersion modeling system. No significant air quality impacts would result from the project because emissions will be controlled through the use of inherently low-emission natural gas combustion turbine technology and best available emission control technology. In addition, the potential public health impacts from the operation of the AEC would not exceed applicable thresholds as demonstrated by the Human Health Risk Assessment included in Section 5.9, Public Health.

Federal and state non-attainment pollutants emitted from the project would be fully offset under the provisions of South Coast Air Quality Management District (SCAQMD) Rule 1304(a)(2) and the procedures and processes in Rule 1315. Emission offsets for PM₁₀, SO₂, and volatile organic compounds, and RECLAIM Trading Credits for NO_x emissions would be retired and accounted for consistent with federal, state, and SCAQMD requirements for the project. The project would be consistent with the SCAQMD's plan to eliminate older, less-efficient power generating plants and would generate in excess of \$140 million in fees to the SCAQMD to be used for local air quality improvement projects consistent with the SCAQMD's Air Quality Management Plan. The AEC will help California and southern California obtain their Clean Energy and Clean Air objectives by lowering the total emissions associated with electrical power generation and enabling a greater percentage of renewable generation to serve southern California demand. See Section 5.1, Air Quality, for a detailed analysis of the air quality impacts from the project.

Consistent with the Energy Action Plan, as drafted by the CEC and the CPUC, the AEC will assist in meeting the state's goal of ensuring that electric energy in the state is "adequate, affordable, technologically advanced, and environmentally sound." It will also assist in meeting greenhouse gas reduction targets under the Global Warming Solutions Act of 2006 (AB 32), and will help utilities integrate renewable energy into

their systems as required under California's RPS. The AEC will also provide needed electric generation capacity with improved efficiency and operational flexibility to help meet southern California's long-term electricity needs and Clean Air objectives.

1.6.2 Biological Resources

There are no federal or state listed threatened, endangered, or candidate plant or wildlife species at the AEC site or along the offsite pipeline alignment. In addition, there is no suitable terrestrial or aquatic habitat on the AEC site or along the offsite pipeline alignment. Potential indirect impacts from operation of the facility will be less than significant. Potential impacts to wildlife or plants that could occur as a result of demolition of the existing units and the construction and operation of the AEC will be less than significant with avoidance, incorporation of project design features, and implementation of mitigation measures.

The AEC will eliminate the use of ocean water OTC for power generation. The AEC will draw process water from an existing water supply system and then discharge wastewater to the LBWD's sanitary system. Therefore, there will be no mechanism for entrainment or impingement of aquatic species during plant operation. There will be a significant decrease in outfall discharge from current use levels because facility process and sanitary discharge to the San Gabriel River will be eliminated. The discharge of stormwater will be via the existing, permitted outfalls. Section 5.2, Biological Resources, provides a detailed analysis of biological resources.

1.6.3 Noise

Ambient noise monitoring was conducted at the project site, and an acoustical model was prepared for the project. The final design of the AEC facility will ensure the applicable City of Long Beach noise ordinances are met and no significant impact will result from the project. The AEC consists of modification to the existing Alamitos Generating Station and does not represent a new source of noise on a previously unused parcel. The AEC proposes to implement measures to minimize potential noise impacts from project construction and operation such as a noise hot line, noise complaint resolution, and if a traditional, high-pressure steam blow process is used, the Project Owner will limit use to daytime hours and equip the steam blow piping with a silencer that reduces the noise of steam blows. Section 5.7, Noise, provides a detailed analysis of the noise assessment.

1.6.4 Visual Resources

The AEC will result in an improvement to the aesthetic quality of the project area because it will result in the removal of the existing Alamitos Generating Station facilities, which are significantly larger in size, height, and footprint than the AEC. The tallest structures in the proposed plant will be the twelve 120-foot stacks, which are 80 to 90 feet lower than the six 200+-foot-tall stacks of the existing plant. The AEC is located in an industrial area and has been designed in keeping with the surrounding industrial landscape. This determination was based on an analysis of simulated views of the project from three key observation points. Section 5.13, Visual Resources, provides a detailed discussion of the visual resources assessment.

1.6.5 Water Resources

The AEC will result in the elimination of the use of ocean water at the project site. Ocean water intake as a result of the elimination of OTC will be reduced to zero upon implementation of the AEC. Discharge flows to the San Gabriel River will be reduced significantly and will only entail the discharge of stormwater. Process wastewater and sanitary wastewater will be conveyed to the LBWD sanitary system through a new wastewater pipeline connection. Stormwater will be collected into the existing stormwater system that includes two recontoured onsite retention basins and then ultimately discharged to the San Gabriel River through the existing stormwater outfalls in compliance with the National Pollutant Discharge Elimination System General Permit for discharge of stormwater associated with industrial activities.

The annual potable water requirements for operation of the AEC will be substantially less than historical potable water consumption of the existing Alamitos Generating Station from 2010 through 2012. AEC water use will be approximately 165.6 gallons per minute and approximately 176 acre feet per year, the Alamitos Generating Station has historically used approximately 255 gallons per minute and 412 acre feet per year. Section 5.15, Water Resources, provides a detailed analysis of water resources.

1.7 Key Benefits

1.7.1 Reliability and Environmental

The AEC will provide up to 1,936 MW of operationally flexible, and efficient generating capacity to the Los Angeles Basin Local Reliability Area in general, and specifically to the western Los Angeles Basin sub-area.³ The project will provide local capacity for reliability needs, serve peak southern California energy demand, and provide flexible generation to allow the integration of the ever increasing contribution of variable renewable energy into the electrical grid.

As an MSG facility, the project will displace older and less-efficient generation in southern California, and has been designed to start and stop very quickly and frequently and be able to quickly ramp up and down through a wide range of electrical output. In addition to an efficient and low heat rate, the AEC's operational flexibility will mean the facility will be able to run at partial load while maintaining a low greenhouse gas emission rate. Quick-starting capabilities also mean that the AEC will not need to operate at times of low power demand to keep "warm" to be called upon on short notice, thereby decreasing emissions compared to conventional power plants that must be kept on and "idling" between periods of high electricity demand.

As more renewable electrical resources are brought on line as a result of electric utilities meeting California's RPS, projects strategically located within load centers and designed for fast starts and ramp up/ramp-down capability, such as the AEC, will be critical in supporting local electrical reliability and grid stability. Thus, the AEC avoids the potentially significant effects associated with the addition of transmission system improvements and other generation to meet this reliability need. The AEC will serve the western Los Angeles Basin load center without constructing new transmission facilities.

The AEC will have superior thermal efficiency, resulting in fewer air emissions of criteria pollutants on a pound-per-megawatt basis than the existing Alamitos Generating Station, providing positive public health benefits. By being able to deliver flexible operating characteristics across a wide range of generating capacity, at a relatively consistent and superior heat rate, the AEC will help lower the overall greenhouse gas emissions resulting from electrical generation in southern California.

The AEC design achieves a very high level of efficiency across a wide range of generating capacity, making it the most efficient design for the intended operational profile. By replacing the existing Alamitos Generating Station, the AEC will be providing fast response, modern, clean and efficient electrical power that fully supports and will enable California to achieve a much greater use of, and reliance on, intermittent renewable electricity sources, such as wind and solar, while also serving local electrical reliability needs, furthering California's RPS and greenhouse gas policies. The MSG configuration will allow the AEC to generate power across a wide and flexible operating range, allowing for integration of California's growing intermittent renewable resource portfolio. Additionally, the AEC, with its more compact combined-cycle design and shorter exhaust stacks, will result in a reduced visual impact compared to the existing Alamitos Generating Station.

In terms of biological resources, locating the project on an existing power plant site allows reuse of an existing industrial brownfield site, and the reuse of existing infrastructure to avoid and minimize potential land use impacts. But for a single wastewater line to connect to the existing LBWD system, the AEC project

³ As defined by the CAISO's "Local Capacity Technical Study Overview and Results" report dated April 17, 2012.

does not require the construction of any other new offsite linears including gas and potable water supply lines, and transmission interconnections. This reduces potential offsite environmental impacts.

With respect to water resources, the AEC design uses a dry cooling technology, which uses less water relative to a similarly sized wet-cooled facility. The annual water requirements for the AEC if it were to operate continuously for the maximum permitted hours per year (3,685 hours per year or a 42 percent annual capacity factor) will be approximately 176 acre-feet per year, substantially less than the actual historical water consumption of the existing Alamitos Generating Station. Based on water volumes from 2010 through 2012, the Alamitos Generating Station has historically used approximately 255 gallons per minute and 412 acre-feet per year while operating at only 8 percent of its maximum capacity.

1.7.2 Employment and Economic Benefits

The AEC's capital cost for power plant equipment is estimated to be between approximately \$1.1 billion and \$1.3 billion, and the total project cost represents an even larger investment in southern California. There will be approximately \$89.79 million in local purchases of materials and supplies during construction and demolition and approximately \$8,312,000 per year of local operational expenditures. In addition, the AEC is expected to bring increased property tax revenue to the City of Long Beach.

The AEC will result in a peak of approximately 447 construction and demolition workers occurring in months 29 through 31, and the average workforce during construction and demolition will be 146 workers. The operating facility will permanently employ an average workforce of 51, including plant operators, supervisors, administrative personnel, mechanics, and electricians. Operational staff will typically work in three rotating shifts with administrative and supervisory staff working 8 hour shifts, 5 days a week. The facility will be capable of operating 24 hours per day, 7 days per week.

The AEC will use the services of local or regional firms for major maintenance and overhauls, plant supplies, and other support services throughout the life of the facility, resulting in additional direct employment and economic benefits.

1.8 Persons Who Prepared the AFC

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

1.9 References

California Independent System Operator (CAISO). 2011. *Once-Through Cooling & AB1318 Study Results*. December 8.

California Independent System Operator (CAISO). 2012a. 2011-2012 Transmission Plan. March 23.

California Independent System Operator (CAISO). 2012b. 2012/2013 Transmission Planning Process Unified Planning Assumptions and Study Plan. March 30.

California Public Utilities Commission (CPUC). 2013. Decision Authorizing Long-Term Procurement for Local Capacity Requirements (Decision 13-02-015). February 13.