

Executive Summary

1.1 Project Overview

CPV Vacaville, LLC, (CPVV or Applicant) proposes to construct, own, and operate an electrical generating plant in Vacaville, Solano County, California. The CPV Vaca Station (CPVVS or project) will be a natural gas-fired, combined-cycle electrical generating facility rated at a nominal generating capacity of 660 megawatts (MW). The CPVVS is proposed for a 24-acre site at the intersection of Lewis and Fry roads in a rural area within the city limits of Vacaville. Surrounding land uses include the City of Vacaville's (City) wastewater treatment plant to the northwest, and agricultural uses to the east, west, and south. This Application for Certification (AFC) has been prepared in accordance with the California Energy Commission's (CEC) "Information requirements for an Application" as described in Appendix B of the CEC's *Rules of Practice and Procedure, Power Plant Site Certification and Designation of Transmission Corridor Zones* (CEC 140-2008-03, July 2008). Worksheets describing, for each discipline, the data adequacy requirements and the sections or pages of the AFC within which the information requirements are met are included in Volume II, Appendix 1A.

1.1.1 Project Objectives

The CPVVS would provide needed electric generation capacity with improved efficiency and operational flexibility to help meet Northern California's long-term electricity needs. Pacific Gas and Electric Company (PG&E) has identified a near-term need for new power facilities that can be on line by or before 2015 and that can support easily dispatchable and flexible system operation. PG&E has recently issued a Request for Offers to obtain these energy resources from qualified bidders. The CPVVS's project objectives are consistent with this need as follows:

- Provide the most efficient, reliable, and predictable power supply available by using combined-cycle natural gas-fired combustion turbine technology capable of supporting the growing power needs of Solano County and the Vacaville area
- Use state-of-the-art technology to provide operational flexibility and rapid-start and dispatch capability
- Site the project adjacent to or near a wastewater treatment plant with the capacity to provide up to 6.3 million gallons per day of recycled water for cooling and other plant makeup water uses
- Site the project as near as possible to 230-kV high-voltage electrical transmission lines and a high-pressure natural gas transmission pipeline
- Site the project near an existing natural gas supply pipeline
- Minimize environmental impacts

A parcel map of the CPVVS site is attached as Appendix 1B. A list of the property owners located within 1,000 feet of the proposed site and 500 feet of the natural gas pipeline and electrical transmission line is attached as Appendix 1C. The Assessor's Parcel Number is 0142-200-040. The project site is located in Township 6N, Range 1E, and northeast quarter of Section 30 (Mount Diablo Base and Meridian).

Figure 1.1-1 is an architectural rendering of the project. Figure 1.1-2 shows the location of the project within the Solano County region. Figure 1.1-3 shows the site location. The project will include the following features:

- The project is a 660-megawatt (MW) nominal, natural gas-fired, combined-cycle generating plant with either two General Electric Frame 7FA or two Siemens SGT6 5000F combustion turbine-generators (CTGs), a single condensing steam turbine generator (STG), a deaerating surface condenser, a 12-cell mechanical draft cooling tower, and associated support equipment.
- The CTGs will be equipped with evaporative coolers on the inlet air system and dry low NO_x combustors.
- The heat recovery steam generators (HRSGs) will be of the horizontal, natural circulation type, equipped with duct burners. The emission reduction system will include a selective catalytic reduction (SCR) unit to control NO_x stack emissions and an oxidation catalyst to control carbon monoxide and volatile organic compounds emissions.
- A nominal 1,000-kilowatt (kW), diesel-fired emergency generator will also be included in the project.
- The project makeup water supply will consist entirely of reclaimed secondary-treated wastewater from the Easterly Wastewater Treatment Plant (EWTP). The secondary-treated wastewater supply from the EWTP will be treated on site to meet California Title 22 requirements for the industrial reuse of secondary-treated wastewaters. Tertiary treatment filter backwash will be returned to the headworks of the EWTP.
- A zero liquid discharge (ZLD) treatment system will process all plant wastewater streams not recovered for reuse within the project. Small quantities of specific wastewaters (such as some equipment cleaning wastewaters) that cannot be made suitable for treatment in the ZLD system or plant reuse will be collected for offsite disposal at a licensed treatment, storage, and disposal (TSD) facility. As a result, no process wastewater (except for the tertiary-treatment system filter backwash) will be discharged from the project.
- The project will use a small amount of the local municipal drinking water supply for plant personnel potable water uses.

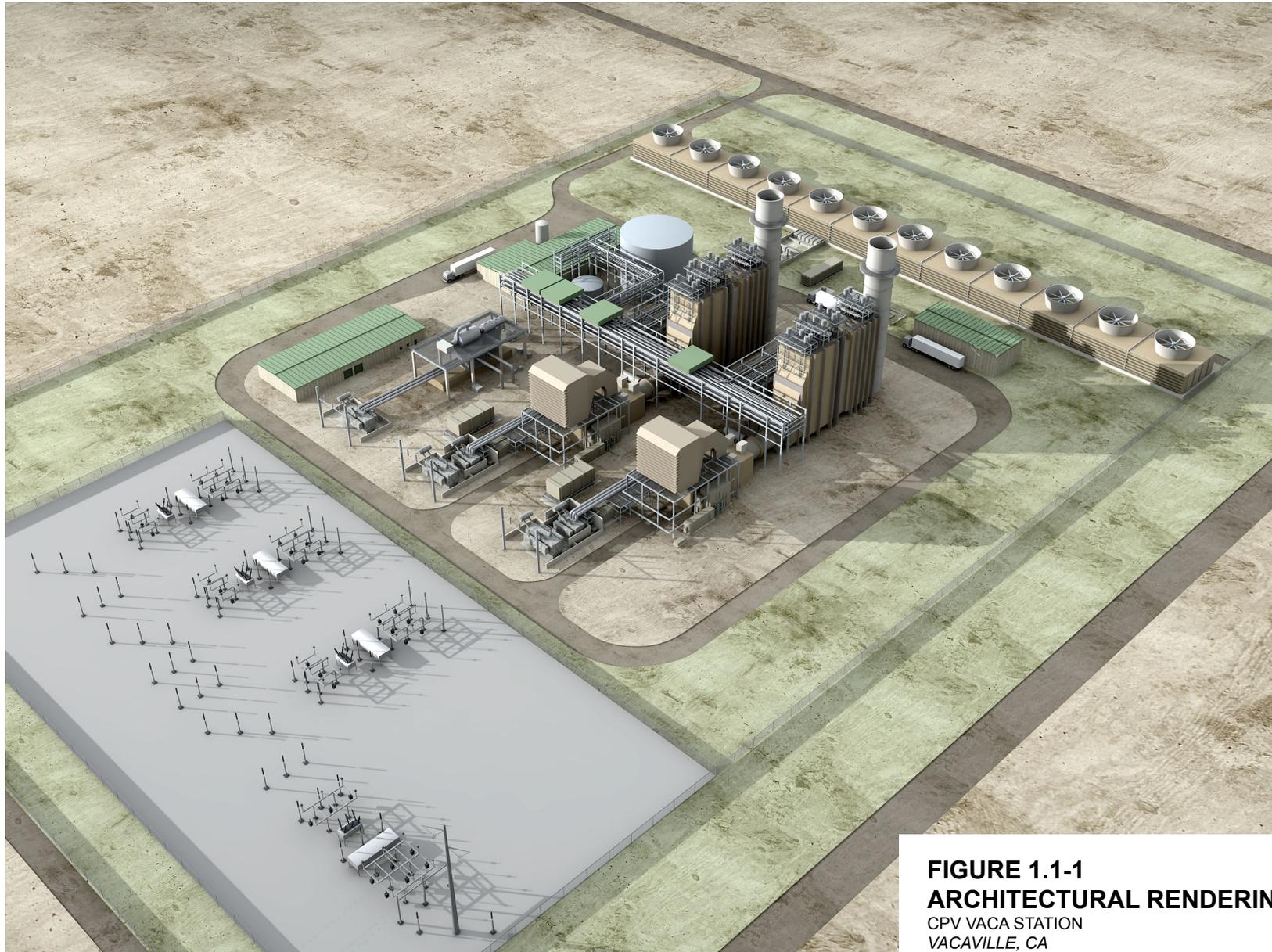


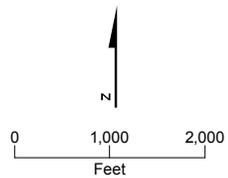
FIGURE 1.1-1
ARCHITECTURAL RENDERING
CPV VACA STATION
VACAVILLE, CA



VICINITY MAP

LEGEND

-  Natural Gas Pipeline Route
-  Electrical Transmission Line Route
-  Utility Corridor to WWTP
-  New Substation
-  Construction Laydown Area
-  Project Boundary



**FIGURE 1.1-3
PROJECT LOCATION**
CPV VACA STATION
VACAVILLE, CA

- A 230-kV onsite switchyard will deliver the project's power directly to the grid through a single-circuit 230-kV transmission line that will be located adjacent to the project site. This new line will be constructed along the current alignment of Fry Road and will extend for approximately 1 mile to the west to a connection with a new 6-acre switchyard to be constructed on nearby property. This new switchyard will be located adjacent to and loop into the two existing 230-kV circuits – Vaca-Dixon to Lambie and Vaca-Dixon to Peabody.
- Approximately 1.03 miles of 16-inch-diameter underground natural gas pipeline will convey gas from PG&E Line 401 to the project site. This line will run in a 70-foot-wide easement following Fry Road east to the connection point.
- A 2,600-foot-long utility corridor between the CPVVS and the adjacent EWTP. The following pipelines will run in this 70-foot-wide corridor:
 - A 20-inch-diameter recycled water pipeline
 - A 6-inch-diameter sanitary sewer pipeline
 - A 12-inch-diameter potable water pipeline
 - A 6-inch-diameter pipeline to return tertiary-treated wastewater

1.2 Project Owner

CPV Vacaville, LLC, is a wholly owned subsidiary of Competitive Power Ventures Development, Inc., which is a wholly owned subsidiary of Competitive Power Ventures, Inc. (CPV). CPV is a greenfield development, asset management, and transaction execution company focused on the North American power generation market. CPV currently manages over 7,000 MW of operational power generation and is the largest third-party provider of "Owner for Hire" asset management services in the gas-fired power plant sector. CPV has embarked on an aggressive development program for power generation facilities, involving more than 6,000 MW across select markets in North America. CPV's power plant development program encompasses clean, high-efficiency natural gas-fired projects and large-scale renewable projects, particularly wind power projects.

1.3 Project Schedule

CVP is filing this AFC under the CEC's standard certification process. Assuming the project receives a certification by fall 2009, detailed design and construction of the CPVVS will begin in spring of 2011 and will last approximately 30 months. Pre-operational testing of the power plant will begin in fall 2012, and full-scale commercial operation is expected to commence by spring 2013.

1.4 Project Alternatives

A "no project" alternative was considered and rejected. The no project alternative fails to meet the basic project objectives of the CPVVS as described in this AFC. For example, the no project alternative is inconsistent with one of the primary objectives of CPV's program to provide electrical power to support reliable supply and operational flexibility in the

Vacaville area. In addition, the no project alternative could result in greater fuel consumption and air pollution in the state because older, less-efficient plants with higher air emissions would continue to generate power instead of being replaced with cleaner, more efficient plants, such as the CPVVS. Also, due to limited availability of in-state generated electricity, imported electrical energy has proven to be expensive and is not always available.

In addition to the no project alternative, the CPVVS analyzed two possible alternative power plant sites; both were rejected as infeasible. As discussed in more detail in Section 6.0, the alternatives fail to meet most of the CPVVS's basic objectives because of poor site location and the potential to result in more significant environmental impacts.

Alternative routings for the project's linear appurtenances were not considered because the proposed connections to natural gas, sanitary sewer and water, and the transmission system are the most direct and shortest possible.

Several alternative generating technologies were reviewed in a process that ultimately resulted in the selection of a state-of-the-art, combined-cycle, natural gas-fired combustion turbine power plant for the CPVVS. The alternative technologies that were evaluated 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. For reasons described in Section 6.0, none of these technologies was capable of meeting the basic project objectives. The combined-cycle turbine technology selected for the CPVVS was chosen as the technology that most effectively and efficiently meets the project objectives.

1.5 Environmental Considerations

Pursuant to the requirements set forth in existing environmental laws and the CEC's regulations, sixteen areas of possible environmental impacts from the project were investigated. Detailed descriptions and analyses of these areas are presented in Sections 5.1 through 5.16 of the AFC. As discussed in detail in this AFC, with the implementation of the proposed mitigation measures, the anticipated Conditions of Certification, and the provision of emission offsets, there will be no significant unmitigated environmental impacts associated with the construction and operation of the CPVVS. This Executive Summary highlights findings related to five subject areas that have historically received the greatest level of attention in CEC proceedings: air quality, biological resources, noise, visual resources, and water resources.

1.5.1 Air Quality

The CPVVS site is located in a State of California and federal Ambient Air Quality Standards non-attainment area for ozone and a State of California non-attainment area for particulate matter with a diameter less than 10 microns (PM₁₀). The area is attainment or unclassified for carbon monoxide, NO_x, PM 2.5, and the state of California sulfur dioxide standard. Like most of the state, it is unclassified for the federal sulfur dioxide standard. An assessment of the impacts on air quality was performed using air dispersion modeling, and the impacts were all less than the California Ambient Air Quality Standards. The potential air quality impacts from the CPVVS will be mitigated by the installation and operation of

best available control technology for the combustion turbines and support equipment and by the provision of emission reduction credits. The project will have no significant adverse impact on air quality or public health. See Section 5.1 for a detailed analysis of air quality and Section 5.9 for public health.

In August 2006, the California Legislature passed Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006. AB 32 requires California resource agencies to establish a comprehensive program of regulatory and market mechanisms to achieve reductions in greenhouse gas emissions. The CPVVS helps to meet the goal of minimizing greenhouse gas emissions by providing electrical reliability and load support with higher efficiencies than most of the existing generation sources. The use of natural gas as a fuel not only emits less carbon dioxide per British thermal unit (Btu) than other fuels such as coal, but its use with combustion turbines with waste heat recapture provides higher design efficiencies than are currently available with other sources. The flexibility of this plant design gives the ability to dispatch and load-follow and also complements the use of renewable resources, such as wind power, on the electricity grid. The CPVVS is one way to reduce the overall greenhouse gas footprint of the electricity provided to serve Solano County.

1.5.2 Biological Resources

The project site is a fallow field with ruderal vegetation that does not contain wetlands or suitable habitat for rare plants known to occur in the project region. The project site may contain foraging habitat for the Swainson's hawk, which is listed by California as threatened, and this species is known to nest in the Alamo Creek riparian corridor about 0.4 mile away. In addition, the project site may contain foraging and nesting habitat for the burrowing owl, a California Department of Fish and Game Species of Concern. The project owner will mitigate potential impacts in accordance with the California Department of Fish and Game policies and guidelines, which may include habitat replacement for both species and the exclusion of potential nesting sites for the burrowing owl prior to the nesting season.

Ground-nesting birds protected under the Migratory Bird Treaty Act are periodically present on the project site. Impacts on nesting migratory birds will be avoided, however, by the City's practice of discing the project site during the non-nesting season (November through January) thereby making the site unpalatable to most bird species for nesting, and by mitigation measures that call for pre-construction surveys to identify nests. The project site does not contain wetlands or federally listed species and will not require federal permits for wetlands or endangered species. Section 5.2 discusses biological resources.

1.5.3 Noise

The City maintains a nighttime noise standard for residential areas of 45 A-weighted decibels (dBA) for stationary noise sources. The applicant conducted 25-hour ambient noise monitoring at the project site and also prepared a noise generation model for the CPVVS. The project will be designed such that noise attributable to the project at the nearest residential receptor, south of the project, would be approximately 44 dBA, meeting the City's standards. The existing ambient noise during the quietest hours of the nighttime is 40 dBA (L₉₀). This ambient nighttime noise, combined with project noise, would result in a

project plus ambient noise level of 45 dBA, which represents a 5 dBA increase. This is within the CEC Staff's guideline that a 0 to 5 dBA increase in an area's background noise, measured as the average L_{90} of the four quietest nighttime hours, would not represent a significant adverse impact.

1.5.4 Visual Resources

The most prominent visual features of the CPVVS will be the HRSG stacks, at 150 feet. Analysis of simulated views of the project from sensitive viewing positions (key observation points) shows that the project would not cause adverse visual impacts. Ratings of existing visual or scenic quality from residential key observation points range from average to moderately high. Viewer sensitivity at these points is rated as moderate to high. The project is not located in a scenic or protected viewshed. Although the project will be seen by viewers leaving or entering suburban residential areas in Vacaville to the west, these areas are 1.75 miles away, and the CPVVS will not be prominently visible from this area and will not significantly degrade the scenic quality of the existing viewshed. Viewers traveling along Fry Road and some local residents will experience the project as a significant change that will alter the character of the landscape. The City of Vacaville has a plan, however, to erect landscape screening vegetation that will extend down Lewis Road, along Fry Road to Vaca Station Road, and up Vaca Station Road to screen views of the Easterly Wastewater Treatment Plant and its area of future expansion to the west of the CPVVS from viewers to the south, southeast, and southwest. A 70-foot-wide landscape buffer area has been incorporated into the CPVVS's design to accommodate this landscape buffer area. With the addition of the landscape screening, the project would not cause a significant adverse impact to visual resources.

1.5.5 Water Resources

The water to be used for power plant cooling and process water will be secondary-treated reclaimed water supplied by the EWTP, which has a sufficient recycled water supply to serve the project. This water will be treated to tertiary standards at the CPVVS. The facility will have a very small industrial process discharge (tertiary-treatment system filter backwash that is returned to the EWTP) and will use a ZLD system to recycle and dispose of all other process wastewaters. Total water use assuming the Siemens option would be about 2,254 gallons per minute (average use assuming the Siemens option) or about 1,185 million gallons per year (3,636 acre-feet). Average annual water use with the GE Energy 7FA option would be 1,852 gpm, or 2,987 acre-feet per year. These figures assume, as a maximum case, full-time operation (8,760 hours per year). In practice, the project will not operate full time because it will be out of operation for maintenance, due to economic dispatch, and for other reasons throughout the year.

Stormwater runoff from the project site during construction and operation will be carefully controlled using an engineered drainage system, oily water separators, and standard best management practices. Stormwater will be routed to an on-site retention pond and will not be released off site and will therefore have no adverse effect on water quality or drainage and flood potential in nearby areas. Section 5.15 contains a detailed analysis of water resources.

1.6 Key Benefits

1.6.1 Environmental

The CPVVS will use advanced, high-efficiency, combustion turbine technology, SCR, an oxidation catalyst and clean burning natural gas to minimize emissions from the facility. NO_x emissions (a precursor to ozone formation) produced by the CPVVS will be at least 90 percent less per megawatt than those produced by many older, existing power plants. In addition to the significant reduction of emissions relative to many existing plants, the CPVVS operating efficiency will be such that the plant will consume less fuel than older plants of similar size, resulting in lower greenhouse gas emissions relative to existing plants.

The use of tertiary-treated water as primary cooling and process water for the CPVVS will prevent an additional continuous demand on the local potable water system and will allow effective use of the area's recycled water supply.

1.6.2 Employment and Economic Benefits

The project will provide for a peak of approximately 664 construction jobs over a 24-month period. The average number of workers during the construction period will be 299. The facility will permanently employ 31 persons, including 17 power plant technicians, and electrician, chemist, engineering, mechanic, and administrative personnel.

In addition to the direct employment benefit, the CPVVS plant will require and 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.

CPVVS is expected to bring increased property tax revenue to the City. Assuming a capital cost of \$450 to \$500 million, CPVVS will generate about between \$4.9 and \$5.4 million in property taxes annually.

1.7 Community Involvement

CPVV has developed a public outreach program to inform civic leaders and community groups about the project. The program will consist of the following initiatives.

Active Community Outreach – CPVV will engage in an active community outreach program during development and operation of the facility. The community outreach component will be designed to share plans, timetables and other pertinent project information with affected stakeholders. Components of the community outreach program will include:

- Project briefings with elected officials, community and business leaders and civic groups
- Small group meetings among project neighbors
- A project open house with company experts and consultants available to present information and answer questions about all aspects of the project

Project Website – CPVV will develop an informational internet website exclusively for this project to provide interested stakeholders with information about the project, combined-cycle technology, scheduling milestones, resources for more information, and company contact information. It is anticipated that this website will be operational early within the development process.

Community Advisory Committee (CAC) – CPVV will seek interest in forming a CAC to provide a structured opportunity for community stakeholders to provide input and feedback throughout the development process to ensure that the priorities of the community are heard and addressed. The CAC could meet on a bi-monthly or quarterly basis and function throughout the development and construction process. Potentially, the CAC could continue to function upon commissioning of the facility if desired by the CAC at a later date.

The CAC will comprise 10 to 15 interested parties and may include:

- Representatives from the City government
- Representatives from CPVV
- Local residents living in close proximity to the project
- Local economic development representatives
- Representatives from the adjoining Easterly Wastewater Treatment Facility

Paid Advertising – In order to reach the larger community to notify them about important aspects CPVV will employ paid advertisements in local print and broadcast media channels.

Direct Mail – As issues merit, CPVV will contact affected individuals through direct mail to notify people of important dates and events.

1.8 Persons Who Prepared the AFC

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