

**FINDING OF NO SIGNIFICANT IMPACT  
FOR THE  
PACIFIC GAS AND ELECTRIC COMPANY  
COMPRESSED AIR ENERGY STORAGE  
COMPRESSION TESTING PHASE PROJECT, SAN JOAQUIN COUNTY,  
CALIFORNIA**

**AGENCY:** U.S. Department of Energy (DOE)

**ACTION:** Finding of No Significant Impact (FONSI)

**SUMMARY:** DOE completed the *Final Environmental Assessment for the Pacific Gas and Electric Company (PG&E) Compressed Air Energy Storage (CAES) Compression Testing Phase Project, San Joaquin County, California* (DOE/EA-1752). Based on the analysis in the environmental assessment (EA), DOE determined that its proposed action of providing up to \$25 million in financial assistance to PG&E for construction and operation of a CAES compression testing phase project would not result in any significant adverse impacts. PG&E proposes construction, operation and decommissioning of an injection and withdrawal well, air compression equipment, and associated temporary site facilities required to conduct compression testing of a depleted natural gas field. The project would simulate operation of a CAES facility to confirm geological and engineering suitability for this use. The Mokelumne River geologic formation is located on King Island, San Joaquin County, California. The CAES compression testing project would create temporary construction jobs and further PG&E and DOE's understanding of CAES as a Smart Grid technology.

**BACKGROUND:** As part of the American Recovery and Reinvestment Act of 2009 (Recovery Act) (the Recovery Act; Public Law 111-5, 123 Stat. 115), DOE's National Energy Technology Laboratory (NETL), on behalf of the Office of Electricity Delivery and Energy Reliability's Smart Grid Demonstrations Program, is providing up to \$435 million in financial assistance through competitively awarded grants for the deployment of Smart Grid Demonstration projects under Funding Opportunity Announcement DE-FOA-0000036. These projects verify technology viability, quantify costs, validate new business models at a scale that can be readily adapted and replicated around the country, and develop new and innovative forms of energy storage.

The federal proposed action of providing funding for these projects requires compliance with the *National Environmental Policy Act (NEPA) of 1969*, as amended (NEPA; 42 U.S.C. Section 4321 et seq.), Council of Environmental Quality regulations (40 CFR Parts 1500 to 1508), and DOE NEPA implementing regulations (10 CFR Part 1021). DOE prepared an EA to evaluate the potential environmental consequences of providing a grant for PG&E's proposed project under the Smart Grid Initiative.

**PURPOSE AND NEED:** The overall purpose and need for DOE's proposed action, pursuant to the Smart Grid Demonstration Program and the Recovery Act, is to accelerate the development and production of a smarter, more efficient, more resilient electrical grid. DOE believes PG&E's proposed project can meet these objectives because it would: (1) increase power quality and reliability in its service area; (2) reduce impacts associated with carbon emissions; (3) increase energy security through reduced fossil fuel consumption; and (4) further national knowledge and technology of new renewable energy-generating and peak-shifting systems.

**DESCRIPTION OF THE PROPOSED ACTION:** DOE's proposed action is to provide up to \$25 million in financial assistance to PG&E, which has also received approval from the California Public Utilities Commission to obtain matching funds. PG&E proposes to use this financial assistance to fund construction of a temporary facility and conduct pressure testing of a depleted gas well field. Testing would consist of injecting air to build a subsurface bubble within the reservoir sands of the depleted King Island Gas Field, and then conducting a series of pressure tests to further confirm geologic suitability and to obtain more detailed information for project engineering. The cost of the pressure testing phase, which is the subject of this final EA, is estimated to be approximately \$20 to \$25M.

**ALTERNATIVES CONSIDERED:** DOE's alternatives to this project consisted of the 15 other technically acceptable applications it received in response to Funding Opportunity Announcement DE-FOA-0000036, *Recovery Act: Smart Grid Demonstrations*. Before selection DOE made preliminary determinations about the level of review under NEPA based on potentially significant impacts it identified during the review of technically acceptable applications. DOE conducted these preliminary reviews pursuant to 10 CFR 1021.216 and provided them to the selecting official who considered them during the selection process.

Because DOE's Proposed Action under the Smart Grid Demonstrations Program is limited to providing financial assistance in cost sharing arrangements to selected applicants in response to a competitive funding opportunity, DOE's decision is limited to either accepting or rejecting the project proposed by the proponent, including its proposed technology and selected sites. DOE's

consideration of reasonable alternatives is therefore limited to the technically acceptable applications and the No-Action Alternative for each selected project.

Under the No Action Alternative, DOE would not provide funds for the proposed project. For the purposes of the analyses in the EA, DOE assumed that the project would not proceed without federal funding. This assumption establishes a baseline against which the potential environmental impacts of the proposed project can be compared. For comparison purposes, it is assumed no impacts to the existing environment would occur, and the beneficial impacts discussed above would not be realized.

**ENVIRONMENTAL CONSEQUENCES:** DOE evaluated the potential environmental consequences of the proposed project and the No Action Alternative. DOE considered thirteen environmental resource areas in the EA; however, not all areas were evaluated at the same level of detail. A “sliding-scale” approach was used so that those actions with greater potential effect were evaluated in greater detail than those that have little potential for impact. To this end, those resource areas with the higher potential for impacts and greater potential need for mitigation measures were given more emphasis. For the resource categories land use/land resources; waste management; aesthetics and visual resources; utilities, energy, and minerals; and transportation, DOE determined there would be no impacts or the potential impacts would be small, temporary, or both, and therefore did not carry those forward for additional analysis.

The areas DOE evaluated in detail include: air quality; biological resources; noise and vibration; public and occupational health and safety; and water resources as well as those resource areas

that typically interest the public, such as socioeconomics and environmental justice and cultural, historic, and paleontological resources. For these resource areas, DOE determined there would not be significant environmental impacts during the construction and operation phases of the proposed project. The following paragraphs summarize the analyses.

During construction and operation, air emissions would include: (1) combustion emissions from vehicles, heavy-duty equipment, and drilling rig power supplies used to construct the test facilities; (2) fugitive dust from site preparation activities; and (3) emissions of volatile organic compounds including greenhouse gases from the injection and withdrawal well during test operations. These emissions would have minor but short-term impacts that are below the San Joaquin Valley Air Pollution Control District's recommended thresholds of significant impact or the General Conformity *de minimis* threshold values.

Irrigation ditches along roads and near the development site provide marginal- to moderate-quality habitat for the giant garter snake (*Thamnophis gigas*), which is federally listed as a threatened species. The irrigation ditches and ponds also provide habitat for the western pond turtle (*Emys marmorata*), a California species of special concern. Trees within 0.5 mile of the study area provide nesting habitat for Swainson's hawk (*Buteo swainsoni*) and the white-tailed kite (*Elanus leucurus*), which are listed as threatened by California. DOE consulted with the U.S. Fish and Wildlife Service (FWS). With the implementation of standard avoidance and minimization measures, DOE determined that the proposed project would not adversely affect these species. These measures include preconstruction surveys, exclusionary fencing, worker

environmental training, burrow avoidance, road shoulder avoidance, speed limits, and biological monitoring.

The project would involve the productive reuse of a depleted natural gas field. The project's potential to induce seismicity is extremely low, based on recent studies of this phenomenon that involve thousands of oil and gas wells and analysis of the geologic setting.

Well drilling and construction equipment would create noise during the installation phase, and compressors, the withdrawal well air release vent, and choke manifold would create noise during test operations. Detailed modeling of project noise sources and noise attenuation with distance shows that, with the application of an air release stack silencer and other measures, the project would meet San Joaquin County's noise standards at the nearest sensitive receptor.

No previously recorded historic or cultural resources of significance occur in the project's area of potential effects. As the project location is in a former marsh area of the Sacramento-San Joaquin Delta, the discovery of buried archaeological deposits during construction or operation is unlikely. If PG&E were to find cultural deposits during project activities, work would stop immediately and the Native American tribes and California State Historic Preservation Officer (SHPO) would be notified in accordance with the Unanticipated Discovery Plan. DOE has consulted with the California SHPO and interested Native American tribes and it was determined there would be no impacts to federally listed or eligible historic properties. The SHPO agreed with DOE's determination. The site is in an area of recent alluvial deposits of low paleontological sensitivity and there are no previously recorded vertebrate paleontological finds near the project site.

As a direct result of the Tribal consultation process, DOE is hereby requiring PG&E comply with the following conditions regarding cultural resources:

1. PG&E shall prepare an ethnographic study. The ethnographic study may be conducted concurrently with the project activities.
2. PG&E shall perform subsurface testing at the compression testing site. The subsurface testing will include up to 15 shovel pits (approximately 1.5'x3'x1.5-3' in depth). Material recovered from these test pits will be screened through one-quarter inch mesh, or suitable sized mesh acceptable for archeological investigation. PG&E shall require this work be performed by professionals meeting the requirements applicable in California.
3. PG&E shall maintain a copy of the Unanticipated Discovery Plan at the site during construction. The plan will be followed by all parties during sub-surface testing and ground disturbance activities.

The project would create indirect economic consequences because vendors and equipment suppliers would benefit from the orders for project components and support systems. The positive economic benefits would be small.

The evaluation of environmental justice impacts is conducted by determining if adverse effects from the proposed project would disproportionately affect low-income or minority populations. DOE determined that no adverse impacts would occur to any member of the community. Nonetheless, there would be no adverse impacts to any minority or low-income population.

Injected air would mix to some extent with residual natural gas contained in the reservoir sands. Work done to date suggests that the percentage of natural gas contained in air withdrawn from the reservoir should be relatively low; however, some uncertainty remains until preliminary findings can be verified through reservoir testing. It is thus possible that withdrawal air may contain methane in concentrations potentially posing a hazard for onsite workers. This potential hazard would be mitigated by modeling the reservoir behavior during injection and withdrawal testing to determine expected hydrocarbon concentrations, monitoring of the reservoir and withdrawal air for actual concentrations, operational controls to prevent hazardous mixtures from reaching the surface and, if needed, injection of air with a depleted molar oxygen concentration of five percent or less to reduce the hydrocarbon concentrations in the withdrawn air.

Site preparation and construction could result in storm water runoff and soil erosion. To reduce runoff and prevent sediments from entering surface waters, PG&E would use permeable materials to construct the drilling and operation pad. The pad design would direct runoff away from equipment. PG&E would prepare a Storm Water Pollution Prevention Plan in accordance with the National Pollutant Discharge Elimination System General Permit for Storm Water Discharges. The project would use an air-cooled closed-loop cooling system that would minimize the use of fresh water for project operation. Produced water from the compressed air



withdrawal would be stripped from the air stream, captured, and trucked offsite along with other wastewater to be disposed of properly at a certified commercial disposal facility.

**PUBLIC AVAILABILITY:** DOE issued the draft EA on November 26, 2013, and advertised its release in *The Record* (Stockton) and *News-Sentinel* (Lodi) on November 26, 27, and 28, 2013. In addition, DOE sent copies of the draft EA to the San Joaquin County Library in Stockton, California, for public review. DOE established a 35-day public comment period that began November 26, 2013, and ended December 31, 2013. DOE announced it would accept comments by mail, email, or fax. DOE distributed the draft EA to the applicable Federal, State, and local agencies, Native American tribes, and interested individuals.

On April 28, 2014, DOE sent a follow-up consultation letter and an updated Biological Effects Assessment to the FWS in accordance with the review requirements of Section 7 of the Endangered Species Act. The updated information detailed the necessary revised avoidance and mitigation measures as required by FWS to ensure that the proposed project is not likely to adversely affect threatened and endangered species. PG&E cannot proceed with additional construction beyond the original authorization as noted in the FWS letter dated August 2, 2013, until FWS issues an updated concurrence review. PG&E will comply with all avoidance and mitigation measures required by FWS.

On June 7, 2013, DOE sent a letter to the SHPO in accordance with the review requirements of Section 106 of the National Historic Preservation Act, as amended (16 U.S.C. 470 et seq.), and its implementing regulations at 36 CFR Part 800. The letter detailed DOE's investigation of

nearby historic properties and concluded that no historic properties would be affected by the proposed project. The SHPO responded on June 26, 2013, with a letter indicating its agreement with DOE's determination. On August 7, 2013, the SHPO responded with a letter of concurrence that the expanded area of potential effects still would not affect historic properties.

Notices of availability for the final EA and this FONSI were sent to stakeholders and resource agencies that provided comments or consultation, and the documents were made available at: <http://www.netl.doe.gov/library/environmental-assessments>. Copies of the final EA and FONSI can also be obtained by sending a request to:

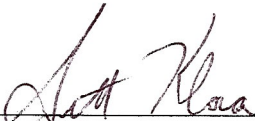
Mr. Joe Zambelli  
U.S. Department of Energy  
National Energy Technology Laboratory  
3610 Collins Ferry Road  
P.O. Box 880  
Morgantown, WV 26507-0880  
Email: [joseph.zambelli@netl.doe.gov](mailto:joseph.zambelli@netl.doe.gov)

During the 35-day public comment period, which ended on December 31, 2013, DOE received one comment letter from the San Joaquin County Environmental Health Department. This letter indicated that this agency had reviewed the draft EA and had no substantive comments on it. DOE received and accepted comments on the draft EA on March 12, 2014, from the Buena Vista Rancheria of Me-Wuk Indians. These comments and DOE's responses are included in the final EA.

**DETERMINATION:** Based on the findings of this EA, and after careful consideration of all public and agency comments, DOE has determined that its proposed – action of providing up to

\$25 million in the form of cost-shared federal funding – and PG&E’s construction and operation of the Compressed Air Energy Storage Compression Testing Phase Project would not significantly affect the quality of the human environment. Therefore, preparation of an environmental impact statement is not required and DOE is issuing this FONSI.

Issued in Pittsburgh, PA, this 15<sup>th</sup> day of May 2014.



---

Scott M. Klara  
Acting Director  
National Energy Technology Laboratory