

PMC-EF2a

(2.04.02)

U.S. DEPARTMENT OF ENERGY  
EERE PROJECT MANAGEMENT CENTER  
NEPA DETERMINATION



RECIPIENT: Geysers Power Company, LLC

STATE: CA

PROJECT TITLE : Recovery Act: Caldwell Ranch Exploration and Confirmation Project

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0000109	DE-EE0004042	GFO-10-610	4042

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), I have made the following determination:

**CX, EA, EIS APPENDIX AND NUMBER:**

## Description:

- A9** Information gathering (including, but not limited to, literature surveys, inventories, audits), data analysis (including computer modeling), document preparation (such as conceptual design or feasibility studies, analytical energy supply and demand studies), and dissemination (including, but not limited to, document mailings, publication, and distribution; and classroom training and informational programs), but not including site characterization or environmental monitoring.
- B5.12** Workover (operations to restore production, such as deepening, plugging back, pulling and resetting lines, and squeeze cementing) of an existing oil, gas, or geothermal well to restore production when workover operations will be restricted to the existing wellpad and not involve any new site preparation or earth work that would adversely affect adjacent habitat.
- B3.1** Onsite and offsite site characterization and environmental monitoring, including siting, construction (or modification), operation, and dismantlement or closing (abandonment) of characterization and monitoring devices and siting, construction, and associated operation of a small-scale laboratory building or renovation of a room in an existing building for sample analysis. Activities covered include, but are not limited to, site characterization and environmental monitoring under CERCLA and RCRA. Specific activities include, but are not limited to:

## Rational for determination:

Geysers Power Company, LLC (GPC) proposes to use DOE and cost share funding to develop and demonstrate geothermal resource at the Caldwell Ranch in Sonoma County, California. GPC proposes to re-enter plug and abandoned wells Prati 5 (P-5), Prati 14 (P-14), Prati 38 (P-38) 1999-2000 and deepen the wells further into the geothermal resource. Workover operations would be restricted to existing well pads and roads to prevent any new surface disturbing activities.

## Phase 1 – Resource Evaluation

A Pre-Drilling Project Analysis would be completed for (1) a drilling and completion program that would address corrosion and associated high temperature conditions; (2) a sampling program for collecting geochemical and isotopic information and; (3) well drilling contingencies as needed.

## Task 1.1 - Compile Existing Data

Calpine would compile data from the WH-5 discovery well, other previously drilled and abandoned relevant wells in the Caldwell Ranch Project, and exploratory data.

## Task 1.2 - Prepare a Pre-Drilling Project Analysis

Prepare a pre-drilling project analysis for each well that is based on the integrated reservoir model showing reservoir boundaries, distribution of noncondensable gases; heat flow, whole rock and fluid isotope analysis (e.g. O18, D, He3, etc); and geologic mapping.

## Task 1.3 - Provide Integrated Reservoir Model

A model would be used to inform the confirmation and re-development of the geothermal leases within the Caldwell Ranch Project area.

## Task 1.4 - Reporting

Phase 1 Pre-Drilling Project Analysis Report and Drilling Plan. All ARRA documentation would be submitted as required.

Go/No Go Decision Point: The determination on whether or not to proceed with the project would be based on a review of the Pre-Drilling Project Analysis and drilling programs to be included in Task 1.4

## Phase 2 – Drilling and Completion

Calpine would re-open and deepen/redrill three wells: P-5, P-14, and P-38 to nominal depths of 10,000 feet, or deeper. These wells would be "un-abandoned" (i.e. re-opened) by drilling out abandonment plugs and reentering the well. This project includes the use of liners within the production zone of the well. Corrosion and the general lack of production liners caused as many as 50% of the wellbores in the Caldwell Ranch Project to collapse and require subsequent workovers. Liners in the production zones should allow the possibility of using the proposed wells as either future production or injection wells if the reservoir is re-developed.

#### Task 2.1 - Prepare Well Head Locations

Prepare well head locations for drilling. This task includes installation of cellars and raising existing casings now cut-off and abandoned below ground level for new wellhead equipment.

#### Task 2.2 - Drilling Activities

Mobilize rig and re-open, clean-out/redrill, and deepen the P-5, P-14 and P-38 wells. Air drilling would be used to drill through the reservoir once the abandonment plugs have been removed from the casing. Liners are planned through the reservoir section of each well as needed.

#### Task 2.3 - Collect Drilling Data

Collect drilling data, cuttings and spot cores for analyses to characterize the target reservoir.

#### Task 2.4 - Reporting

A Phase 2 Report would be prepared and would include the following data for inclusion within the National Geothermal Data System:

All other data collected during the drilling of these wells (e.g.; chemical abatement records, bit records, etc) would be available upon request for submission to the DOE and National Geothermal Data System. All drilling and logging data would be open-filed with the CA Division of Oil, Gas and Geothermal Resources as required, and would be made publicly available on their website.

### Phase 3 – Well Testing

#### Task 3.1 – Flow Testing

Conduct flow testing to determine the deliverability, permeability and static pressure of the steam reservoir. During flow testing, hydrogen sulfide in the steam would be abated in accord with the requirements of the Northern Sonoma County Air Pollution control District (NSCAPCD).

#### Task 3.2 - Log, Sample and Monitor Fluids During Testing

Logs would include high temperature-pressure (PT) and pressure-temperature-spinner (PTS) logs in the reservoir whenever temperature and wellbore conditions allow; and use of a tested high-temperature, downhole sampler to collect both conventional geochemical samples and noble gas isotope samples for analyses. Noncondensable gas (NCG) and condensate samples would be collected during the reservoir testing. Samples would be analyzed for steam and gas constituents. The NCG concentrations are used for the design criteria to reduce NCG concentrations before the steam reaches the turbine, and the air emissions abatement equipment to meet Air Pollution Control District standards. Condensate chloride concentrations would be characterized to determine the design parameters for Chloride Mitigation Facilities (CMF's) used to scrub the steam supply.

#### Task 3.3 - Validation of Testing

DOE would validate reservoir testing. The costs would be incurred by the DOE and are not included in the project costs. Calpine would provide personnel including its reservoir engineering staff to assist DOE where necessary.

#### Task 3.4 – Data Integration and Validation

Interpret test data, integrate well test results with previously collected data, and validate exploration technology/methods. Integrate project data into the newly developed reservoir model to help transfer technology/methods and guide future exploration.

#### Task 3.5 – Assess Resource

Assess reservoir capacity of the Caldwell Ranch Project area for generating electrical power (megawatts).

#### Task 3.6 - Reporting and Publications

All non-proprietary data from the project would be provided to the National Geothermal Data System. Reports and other deliverables would be provided in accordance with the Federal Assistance Reporting Checklist following the instructions included therein. The recipient would attend an annual peer review or equivalent as requested, to present the status and results of project work, and submit data and results for publication. Specifically, data and studies on specialized noble gas isotope analyses would be submitted for publication by Calpine and project partners.

The project is within the jurisdiction of the Northern Sonoma County Air Pollution Control District (NSCAPCD). The NSCAPCD is in attainment for the state particulate (PM 10) standard and is unclassified for the PM 2.5 standard. The District is currently (as of 2008) non-attainment for only the state ozone standard, although the area is in attainment with the federal 8-hour ozone standard. The District is unclassified in attainment for all federal ambient air quality

standards. The NSCAPCD does not have an adopted air quality plan. The district will require an "Authority to Construct" for each of the proposed wells.

The drilling rig engines are permitted under the California Air Resources Board (CARB) Portable Engine Program and thus would utilize the Best Available Control Technology (BACT). The use of construction and diesel equipment, including trucks to support drilling operations, would result in air emissions of dust (PM 10) and diesel particulate emissions. Calpine proposes to use diesel equipment and air compressors that are registered by the California Air Resources Board (CARB) and meet all CARB requirements.

Serpentine rock containing asbestos may be encountered during well drilling. The Asbestos Air Toxic Control Measure for construction, grading, quarrying and surface mining as approved by the California Air Resources Board shall be used.

According to GPC coverage under the National Pollutant Discharge Elimination System (NPDES), General Permit for Storm Water Discharges associated with Construction Activity (General Permit) is obtained; A Storm Water Pollution Prevention Plan was developed that includes Best Management Practices to reduce any potential for sediment in runoff; or erosion and is in place; No wetlands would be disturbed by the proposed action.

In compliance with California Environmental Quality Act (CEQA) regulations, Williams Self Associates Inc. (WSA) contacted the Native American Heritage Commission (NAHC) in Sacramento, California by letter on October 17, 2005, with a description of the proposed project in Sonoma County and a request for a listing of local, interested Native American representatives, and information on traditional or sacred lands within the project area and vicinity. In response, NAHC staff member Ms. Debbie Pilas-Treadway wrote that a "search of the sacred lands file has failed to indicate the presence of Native American cultural resources in the immediate project area" (letter dated October 26, 2005). No cultural resources were observed during the pedestrian archaeological survey of the project area on November 21-22, 2005.

"Biological Assessment with Botanical Survey for the Wildhorse Development Project" was prepared by Northwest Biosurvey October 9, 2007. The survey area encompassed 2,050 acres. A full, in-season floristic level survey was conducted within the survey area with an assessment whether the project area contained sensitive plant wildlife requiring mitigation. The project would not create any new water crossings, existing bridges would be used for roads and pipeline routes. The report found sensitive species that should be present: Central Coast ESU steelhead, foothill yellow-legged frog, northwestern pond turtle, white-tailed kite, sharp-shinned hawk, Cooper's hawk, ferruginous hawk, northern spotted owl, purple martin, yellow warbler, common yellowthroat. Sensitive species determined not or unlikely, to be present: California red-legged frog, golden eagle, peregrine falcon, tricolored blackbird, pallid bat. In addition, the main stem of Squaw Creek, Alder Creek and Hummingbird Creek, have been designated (as of 2005) as critical habitat for the federally (National Marine Fisheries Services) threatened Steelhead (*Oncorhynchus mykiss*). The designation covers the Central California Coast as a distinct population segment (DPS) of Steelhead. No effect would occur to these species, since the proposed action is to remain on existing well pads and roads with the workover operation occurring after the nesting season.

Sonoma County has jurisdiction for the state on this project. Sonoma County completed a State Environmental Review using an Environmental Checklist Form which includes Mitigated Negative Declarations signed in December 2005 and April 2009 which included the construction, plugging and abandonment, maintenance (workover) of P-5, P-14, and P-38.

Tasks identified in the Statement of Project Objectives (SOP) submitted to the DOE and the entire Caldwell Ranch Exploration and Confirmation Project were analyzed in the Sonoma County California Environmental Review to determine if the project would have a large and important impact. The entire Wildhorse Development Geothermal Project (including the Caldwell Ranch Exploration and Confirmation Project) which was analyzed in the Environmental Checklist as part of the Mitigated Negative Declarations (2005 and 2009) therefore the DOE is in agreement with CA's Mitigated Negative Declarations.

Condition of Approval: Mitigation measures identified in the Sonoma County, California Mitigated Negative Declarations UPE05-0114 and UPE08-0062 are applicable to this proposal. This project comprises of restoring production of existing geothermal wells using various techniques while gathering data, making evaluations and required monitoring, therefore this project is categorized into CX A9, B3.1, and B5.12.

#### NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

Insert the following language in the award:

You are required to:  
Follow mitigation measures identified in the Sonoma County, California Mitigated Negative Declarations UPE05-0114 and UPE08-0062

Note to Specialist :

This EF2A was written by Christopher Carusona

**SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.**

NEPA Compliance Officer Signature:   
NEPA Compliance Officer

Date: 9/9/10

**FIELD OFFICE MANAGER DETERMINATION**

Field Office Manager review required

**NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:**

- Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.
- Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

**BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :**

Field Office Manager's Signature: \_\_\_\_\_  
Field Office Manager

Date: \_\_\_\_\_