

# GEOTHERMAL PIPELINE

## Progress and Development Update Geothermal Progress Monitor

### MEETING ANNOUNCEMENTS

1. Geothermal Resources Council 1996 Annual Meeting features Geothermal Development in the Pacific Rim. September 29 - October 2, 1996, Portland Marriott Hotel, Portland, OR.

Field Trip No. 1 - Klamath Falls Direct-Use and Newberry Volcano, September 28 and 29 (2-day trip). The first day will be dedicated to touring the direct-use facilities in Klamath Falls including the city's district heating system, snow melting facilities, heating and cooling system at OIT, a downhole heat exchanger system, Liskey Farms, and other nearby direct-use sites. The second day is a tour of the Newberry caldera and CE Exploration Company's drilling operation on the northwest flank of the caldera. This is a proposed site for a 30-MW power plant.

For a copy of program and registration information, contact: GRC (916) 758-2360 or e-mail: geores@wheel.dcn.davis.ca.us.

2. ASTM Committee E-44 on Solar, Geothermal and Other Alternative Energy Sources will hold a meeting November 21-22, 1996 at Hyatt Regency, New Orleans, LA. ASTM meetings are open to all interested individuals. For a copy of the agenda or other information, please call or contact: Teresa Condrowska, ASTM (610) 832-9718 or e-mail: tcendrow@local.astm.org.

### CALIFORNIA

#### Proposed and Past Geothermal Activities Within the Glass Mountain KGRA

##### Proposed Action

Calpine Corporation submitted a Plan of Utilization (POU) to the BLM for constructing, operating, and maintaining a 49.9-MW (gross) dual-flash geothermal power plant, with associated geothermal production and injection wells, well pads, roads, interconnected geothermal fluid pipelines, and an accompanying 24-mile 230-kV transmission line. This project, known as the Fourmile Hill Geothermal Development Project, would be located at the Glass Mountain Known Geothermal Resource Area (KGRA) on the Klamath and Modoc National Forests.

*Location.* The proposed geothermal power plant, well pads, and fluid pipelines would be located within federal geothermal leases CA21924, CA21925, and CA21926, all within the Glass Mountain KGRA. Leases CA21924 and

CA21926 are located on the Klamath National Forest; while, lease CA21925 is located on the Modoc National Forest. The proposed power plant site would be located in Section 28 within a six-section area known as the Fourmile Hill project area, located in Section 21, 22, 23, 28, 29 and 30, Township 44 North, Range 3 East, MDB&M, Siskiyou County, California. The planned period of commercial operation for the proposed action is 45 years.

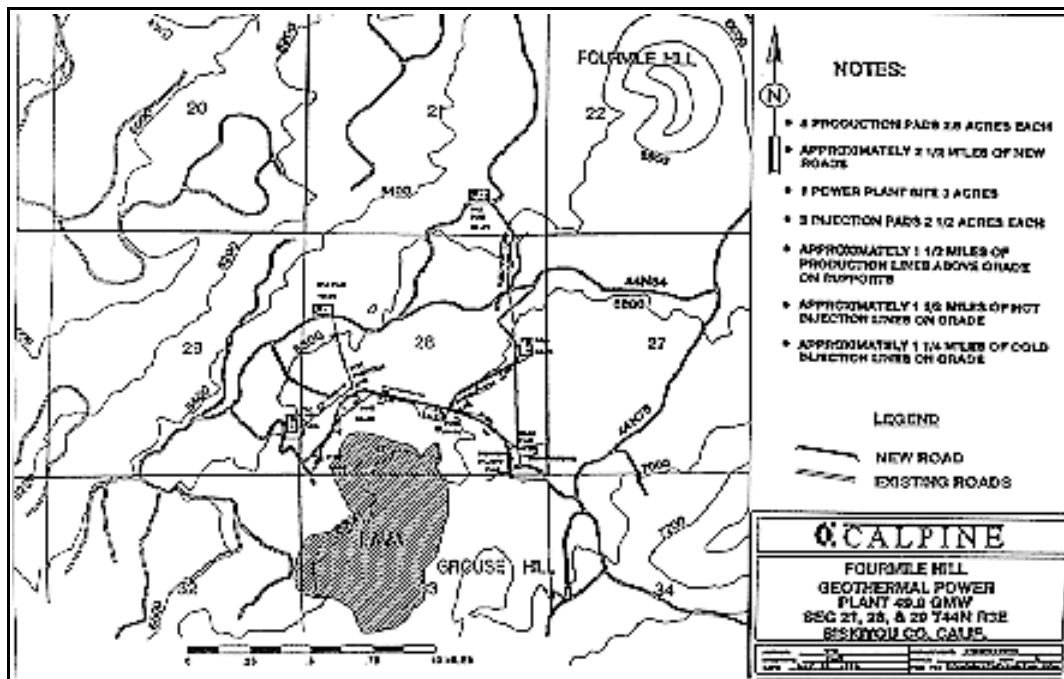
*Power Plant and Associated Facilities.* The proposed action would involve production of geothermal fluids (hot water and steam) from an underground reservoir. These fluids would be produced from 9 to 11 2-phase production wells located at five proposed production well sites (well pads 88-28, 84-28, 56-28, 26-28 and 18-28). The fluids would be transported via surface pipelines to the proposed dual flash geothermal power plant; where, the steam would be directed to two steam turbine-driven generators. Spent brine and condensate would be pumped through surface pipelines to the three proposed injection well pads (well pads 87-29, 13-28 and 67-21) for injection to the subsurface geothermal reservoir. There would be one injection well located at each injection well pad.

Each of the production and injection well pads would occupy approximately 2.5 acres, for a total well pad area of about 20 acres. The power plant site would occupy approximately 3.0 acres. There would be a total of 4.25 miles of surface pipelines (1.5 miles of production lines, and 2.75 miles of injection lines), and about 2.5 miles of new roads associated with the power plant and well pads.

The proposed action would also include development of a transmission line that would extend from the proposed geothermal power plant in an easterly direction for approximately 24 miles to a proposed intertie station along the BPA Malin-Warner transmission line. The Malin-Warner line is a 230-kV system that parallels Highway 139. The proposed transmission line would be constructed using H-frame wood poles with steel structures used at certain locations. The transmission line would be located primarily on the Modoc National Forest, with only a small portion of the line near the power plant site being located on the Klamath National Forest. Right-of-way width would be approximately 125 feet along the constructed length of the transmission line. Construction of access roads for installation of structures and maintenance would be required along portions of the right-of-way.

##### Past Activities

In 1981, the BLM, as lead federal agency for geothermal heating, issued numerous leases within the Medicine Lake area for the purpose of exploring and developing a geothermal resource within the project area (i.e., the Glass Mountain KGRA). As part of the authorization for leasing, the BLM and



**Figure 1. Fourmile Hill project area**

USFS jointly prepared and issued an environmental assessment (EA) for the "casual use and exploration" of the geothermal resource. In 1984, the EA was supplemented to analyze additional potential leases and to address the impacts associated with geothermal development within the KGRA. The supplemental EA identified lease stipulations which provide for surface resource protection measures. These mitigations were and are incorporated as terms and conditions of use and development of the geothermal resource.

As of this date, there has been limited geothermal exploration within the Glass Mountain KGRA; however, within the past two years, there have been two exploration projects proposed in the project vicinity. The first was a proposed exploratory geothermal drilling project within the Glass Mountain KGRA, which was sponsored by the California Energy General Corporation (CEGC). The second project was Calpine's Fourmile Hill Geothermal Exploration Project, which examined the potential environmental effects that would result from an exploratory geothermal drilling program. Environmental assessments and Findings of No Significant Impact (FONSI) were prepared for both of these projects, and were distributed for public review. Records of Decisions (RODs) have been filed for each of these projects as well.

#### Scope of Analysis

This EIS/EIR for the proposed action will identify a reasonable range of alternative actions, analyze the proposed action and alternatives in terms of direct, indirect and cumulative effects, and identify appropriate mitigation measures for each type of significant effect. The analyses in the EIS/EIR will address potential impacts to geology, minerals, soils, geothermal resources, groundwater, surface water, cultural and paleontological resources, Native American resources, vegetation, wildlife, air quality, visual resources, noise levels, land use, recreation, traffic and access, human health and safety, and social and economic values related to development of the project. Cumulative effects will also be addressed; the EIS/ EIR will document the effects on the resources as the result of not only the proposed action, but also of previous actions, and any reasonable foreseeable activities in the vicinity of the proposed action. (Source: Bureau of Land Management, Alturas, CA, June 7, 1996)