

Recharging the Geysers

Calpine Corp. and Santa Rosa Celebrate Completion of the World's Largest Wastewater-to-Energy Project

On Dec. 5, Calpine Corp. (San Jose, CA) and the City of Santa Rosa celebrated the startup of the Santa Rosa Geysers Recharge Project in northern California, which will provide up to 11 million gallons of recycled water to The Geysers Geothermal Field. The 40-mile-long pipeline is the world's largest "wastewater-to-electricity" geothermal project, and ranks ninth among the largest wastewater reuse projects in the United States.

The Geysers pipeline project will dispose of half the wastewater generated annually by Santa Rosa and its three partner cities, Rohnert Park, Cotati and Sebastopol. At the same time, the project will help breathe new life into power production at The Geysers, and extend its commercial life.

Located within 30 square miles straddling the Lake and Sonoma county borders in northern California, The Geysers is the largest geothermal power operation in the world. With 21 power plants (19 owned by Calpine, and 2 owned by the Northern California Power Agency), The Geysers produces nearly 1,000 megawatts (MW) of electricity, or enough to power a million homes. First commercially developed in the 1960s, The Geysers now satisfies much of the electrical power needs of Sonoma, Lake, and Mendocino counties, as well as that of Marin and Napa counties.

The Geysers project is the world's only geothermal system to use wastewater to replenish its steam fields. Nearby Lake County pioneered the world's first wastewater-to-electricity system at The Geysers in 1997. Since constructing a 29-mile pipeline, eight million gallons of treated effluent is injected daily from Lake County, boosting power production at The Geysers by 68 megawatts. Springing from that success, the Santa Rosa Geysers Recharge pipeline system ensures that the city and



City of Santa Rosa

Crews lay the last section of pipeline for the Santa Rosa Geysers Recharge Project, the largest "waste-to-energy" system in the world.

its partners can effectively dispose of its treated effluent while helping Calpine produce clean energy for California.

"By injecting recycled water into The Geysers steam reservoir, the City of Santa Rosa has found an environmentally sound discharge solution and is helping to promote green power production in California," said Calpine Vice President-Geothermal Dennis Gilles. "There are few places on the planet where such a system could be implemented and the City of Santa Rosa is to be complemented for its vision and commitment to environmental stewardship."

Construction of the Santa Rosa-Geysers pipeline began in April 2000. Changing goals of Calpine's city partners, new and more detailed topographic studies, lawsuits and neighborhood opposition changed not only the size of the pipeline, but almost the entire route. Though construction took almost four years instead of a planned two years, and costs rose from an expected \$102 million to \$200 million, the majority of

stakeholders are satisfied with its solution to a vexing environmental problem.

To utilize the Santa Rosa's wastewater from the new pipeline, Calpine spent an additional \$45 million to construct a network of pipes and wells to inject the treated effluent into the geothermal field's deep reservoir. Calpine project manager Steve Burden says the company's costs cover construction of 18 miles of wastewater distribution pipelines, a million-gallon storage tank, a 3,000-horsepower pump station and the conversion of eight steam wells to injection wells in The Geysers.

Steam pressure derived from the injected effluent is expected to provide an additional 85 megawatts of power production. According to the *Santa Rosa Press-Democrat*, the wastewater pipeline will provide even more dividends, including:

- Billions of gallons of leftover wastewater will become available each year to northern Sonoma County farmers, who currently irrigate with water pumped from the Russian River and its tributaries.
- Help for the endangered coho salmon and steelhead trout, whose spawning habitats are depleted when water is pumped out of the river and its tributaries.
- A nearly 60-percent annual reduction (2 billion gallons) of wastewater dumped into the Russian River.

Calpine's ownership in power generation began with the purchase of a five-percent interest in the 20-MW Aidlin facility at The Geysers in 1989. Calpine has since consolidated ownership within the geothermal resource area. As a result, the company is the world's largest private producer of electricity from geothermal resources. The Calpine Geothermal Visitor Center in Middletown, CA offers free tours of one of the company's Geysers power plants. For more information, call: (866) 439-7377. Website: www.geysers.com. (TJC/GRC) ■