



## **NEWBERRY GEOTHERMAL UPDATE**

**October 2009**

### **Newberry Project Selected for DOE Grant Funding**

Davenport Power, Operator for the Newberry Geothermal Project, recently received notification from the U.S. Department of Energy that two Grant applications for exploration and demonstration projects were selected for negotiation and finalization of grant awards under The American Recovery and Reinvestment Act of 2009 (aka “Stimulus Bill”).

One grant application for \$5 million supports “Validation of Innovative Exploration Technologies” (details below).

The second grant application of \$25 million is for an “Enhanced Geothermal System Demonstration” at Newberry (details below). This EGS project is in partnership with AltaRock Energy, Inc., a leader in EGS technologies. Both projects will be on Davenport’s existing lease holdings at Newberry outside the Monument.

“The grant award for these two Projects supports Davenport Power’s belief that Newberry and our geothermal project hold significant promise for testing innovative technologies and for producing electric power. Davenport Power looks forward to the opportunity these efforts may hold for expanding America’s and Oregon’s renewable energy portfolio” stated Doug Perry, President of Davenport. “These represent additional steps in our rigorous and lengthy exploration phase at Newberry to utilize its tremendous geothermal energy potential to produce base-load power that is renewable and clean.”

### **What is Planned and Where is it Located?**

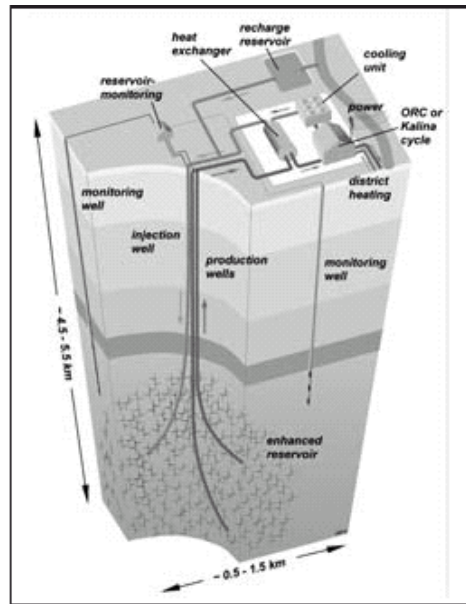
#### ***Innovative Exploration Technologies***

Using a combination of innovative and conventional exploration techniques, a comprehensive analysis approach is being created for use in the geologic formations and rock types located at Newberry. All subsurface work will occur on Davenport’s existing Newberry leases, all of which are outside the Monument.

This analysis will gather data using gravity and magneto-telluric surveys as well as passive seismic monitoring and shallow temperature-gradient wells (with a small footprint and less than 3,500 foot depth). The results will be combined with other geophysical and geochemical data in a 3-D model to produce a better picture of underground geology and aid in developing clean, renewable geothermal energy at Newberry. In addition to producing a better geothermal picture at Newberry, an additional - and longer term - benefit of these innovative exploration techniques will be to give geologists a better set of tools for understanding similar geothermal prospect areas in the Cascade Range and elsewhere.

### ***Enhanced/Engineered Geothermal Systems – ‘EGS’***

This demonstration project is a partnership between Davenport and AltaRock Energy. A deep well, drilled last year to about 10,000 feet, will be used to create an engineered geothermal system (aka “Enhanced Geothermal System” or “EGS”). After exhaustive study and planning a network of small cracks/fractures is created surrounding the bottom of the well by injecting a controlled stream of cold water down the well into deep hot brittle rock. The resulting network of small cracks acts like a reservoir that can be filled with water. This water is heated as it passes over the surrounding hot rock to temperatures high enough for geothermal energy production upon its return to the surface through nearby production wells. Once this heated fluid is used for power production, it is reinjected into the engineered reservoir of small cracks to be reheated, thus creating a relatively continuous heating/power production cycle. “It is hoped that this carefully planned and engineered demonstration reservoir system will be a significant exploration step towards setting the table for providing clean, renewable base-load power from Newberry” stated Doug Perry.



A study of induced seismic activity (e.g. the stimulated creation of small cracks, one millimeter in width by up to five meters length, at Newberry) is being conducted by experts and will be reviewed by government agencies prior to any below ground engineering or stimulation. This study is being done even though Central Oregon is an area of relatively minor seismic activity historically. Seismic activity can naturally result from various human activities including mining; oil, gas, and geothermal production and injection; and pressures from stored water at dams and reservoirs. The stimulated network of small cracks needed for an EGS reservoir involves an injection of water to cause micro-fracturing of deep, hot rock formations. Monitoring and control of all stimulation activity will be on a real-time basis to limit size, scope and duration of micro-fracturing.

Being safe is of paramount importance to Davenport and its partner AltaRock. Focused reviews of existing and new hazard studies and thoughtful discussions of potential risks occurs prior to and during any planned stimulation. “We expect to have continuous oversight regarding risk assessment” stated Perry.

Water supply for the EGS demonstration project will be provided via the purchase of temporary water credits from the Deschutes River Conservancy. This is done pursuant to Oregon Water Resources Department rules and the Deschutes Groundwater Mitigation Bank procedures. Davenport’s temporary credits purchases helps support the Mitigation Bank and Middle Deschutes River restoration.

In the longer term the amount of water - or an alternative – that ultimately will be needed for operating EGS, or even traditional hydrothermal geothermal system, plants at Newberry that transports heat to the surface will depend on a number of factors that are not known at this time. These factors include plant size (number of MW’s), plant type and efficiency, and whether or not there will be any fluid losses, etc. from any EGS reservoirs. It is possible that over time there may be a mix of options, such as liquefied CO<sub>2</sub> and other technologies that are under development and testing, to transport heat from EGS reservoirs deep in the earth to the surface so that less water will be needed.

### **Why at Newberry?**

Geothermal heat in quantity and at relatively shallow depths does not occur at every location in America. Rather, it exists where very hot rocks are found closest to the surface.

Since the early 1970s Newberry’s geothermal heat potential has been studied extensively by U.S. Geological Survey scientists and others. In 1990 Congress established the Newberry Monument recognizing two goals – protect forever, as a special place, the geologic wonders of Newberry and set up opportunities for leasing and development of renewable base-load geothermal power outside the Monument’s boundaries. In 2008 this opportunity was supported with high heat found at 10,000 feet below the surface in Davenport’s wells. “Newberry’s deep rock formations appear very conducive to demonstrating and ultimately developing EGS projects,” Perry stated.

An MIT report published in 2007 indicates that thousands of megawatts of renewable, clean electricity potential lie within the first miles of the earth’s surface mantle and that this energy potentially could be harnessed through EGS technologies. See [http://geothermal.inel.gov/publications/future\\_of\\_geothermal\\_energy.pdf](http://geothermal.inel.gov/publications/future_of_geothermal_energy.pdf)

**Davenport Power**, Operator for the Newberry Geothermal Project, is dedicated to finding and utilizing geothermal resources in a safe and environmentally responsible manner. Davenport's team includes highly experienced geothermal energy specialists who are committed to building and operating facilities that will be a good neighbor and a prudent land steward in Central Oregon. Davenport’s managers have participated in the senior management of companies that developed or acquired over 5,000 MW of facilities using geothermal or other technologies and fuel types.

### **Communication and Outreach**

Davenport strives to keep local, state, and federal elected officials, key organizations, and interested community stakeholders and citizens informed. We desire to maintain an open dialogue with interested parties. For additional Project history and information about Davenport and the Newberry Geothermal Project, visit us online at [www.newberrygeothermal.com](http://www.newberrygeothermal.com).

### **Mailing List Changes and Information Requests**

If you wish to be added to our mailing list, update your contact information, or be removed from our mailing list, please contact our Bend office at 541-323-1190 or email us at [info@newberrygeothermal.com](mailto:info@newberrygeothermal.com) with your requests.

Thank you for your interest in the Newberry Geothermal Project and renewable energy!

### **Doug Perry**

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