

# Decision Record

**NEPA Register Number:** DOI-BLM-OR-P000-2011-0003-EA

**Title of Action:** Newberry Volcano Enhanced Geothermal System (EGS) Demonstration Project

**BLM Office:** Prineville District, Oregon

## Decision

After a review of the comments received, and based on the Environmental Assessment (DOI-BLM-OR-P000-2011-0003-EA) and the Finding of No Significant Impact, it is my decision to allow Davenport Newberry Holdings LLC (“Davenport”) and AltaRock Energy, Inc. (collectively the “Proponents”) to develop and test an Enhanced Geothermal System (EGS) (“Project”) as described in Alternative A of the EA which is incorporated by reference and summarized below. The application is approved subject to the terms, conditions, stipulations, and environmental protection measures reflected in this Decision Record. All project design features from Alternative A of the EA have been incorporated into this decision. The Project area is 22 miles south of Bend Oregon within the Bend-Fort Rock Ranger District of the Deschutes National Forest. The entire Project is located on national forest system lands.

This Project will enable the Proponents to create, test, and demonstrate the EGS reservoir technology and its potential for electricity generation in areas with underground heat but little or no natural water. The decision to approve this EGS Project does not allow for the production of electricity and no facilities capable of generating electric power are being proposed. Further analysis under NEPA would be required prior to any future decision to develop an electric production facility at Newberry.

Development and testing of the EGS will take about two years, and involve several components, including the development of an underground reservoir, one “stimulation” well to help create the reservoir and transport water to it, two production like wells to transport heated water out of the reservoir, and an array of seismic monitoring devices.

## Underground reservoir

Creation of the EGS involves engineering a “reservoir” in suitable hot rocks where water can circulate through and heat up, much like the heat exchange process of a radiator. The reservoir is created using a process termed “hydroshearing,” where cold water is injected into an existing well at relatively high pressures in order to expand a network of existing natural fractures along three separate but stacked fracture sets at depths between 6,500 and 10,060 feet. The “hydroshearing” will be staged in order to create the three separate stacked fracture sets. The existing well (called NWG #55-29) is 10,060 feet deep, developed by Davenport in 2008 on federal geothermal lease OR40497. Data from the existing well shows this site has a great deal

of heat (> 600 ° F) in the deep underground rock formations but it does not have sufficient natural water nor permeability for a standard hydrothermal geothermal system. Diverters will be used to direct the water used to stimulate to specific areas of pre-existing fractures. Shallow groundwater wells will provide water for the Project.

## **Wells**

After the reservoir has been created, water and small amounts of tracers commonly used in groundwater studies will be pumped down the existing well (the “stimulation” well) and into the created EGS reservoir where it will become heated as it circulates through the hot rocks. It will then be brought back up to the surface as hot water via two production like wells. These wells will be directionally drilled from the same well pad used for the existing well, and into opposite ends of the newly created EGS reservoir.

## **Seismic monitoring devices**

Minute fractures created and reopened by the hydroshearing process will cause microseismic events which will be mapped and monitored throughout the stimulation process. Monitoring the micro fractures will be accomplished through an array of microseismometers installed either a few feet below ground (surface stations) or in nearby boreholes drilled to a depth of up to 1,100 feet. Up to 20 monitoring sites will be used; 10 surface and 10 borehole. The surface sites will be located in areas that do not require tree removal and consist of shallow holes dug with hand tools one to four feet deep and two feet in diameter. Of the 10 borehole sites, seven will be located in existing wells or at sites currently approved for such wells. Up to three new boreholes (6 ¼ inch diameter; up to 1,100 feet deep) will be drilled using a truck-mounted drilling rig requiring vegetation to be removed from 0.6 acre total (0.2 acres each). A small solar panel and telemetry antenna will be installed adjacent to each monitoring site. Each solar panel will be approximately two feet square and the antenna similar in length. In most cases these will be installed in a nearby tree. Where this is not feasible, a 10 to 40 foot telescoping pole will be used. Two repeater stations of similar design may also be installed. All sites are accessible from existing roads and no new roads will be constructed.

## **Project Design Features**

The following project design features will be applied to the Project. The design features were sometimes referred to as best management practices (BMP) or mitigation in the EA; the terms are used interchangeably in this Project. The BLM and Forest Service developed the following list during preparation of the EA, with input from tribes, agencies and the public. As part of my decision, I am requiring that they be implemented.

### ***Wildlife***

If nesting raptors are located within ½ mile of any of the new borehole micro seismic array (MSA) sites, a Forest Service wildlife biologist will determine whether drilling will be timed to not occur during the breeding season for the following species:



exiting the road crossing. If this does not provide a safe surface for the truck mounted drill rig to drive on, some areas may be plowed to provide access with Forest Service approval. A minimum of two inches of snow depth will be left to protect the roadway and allow snow mobile access. Appropriate signing meeting Manual of Uniform Traffic Control Devices standards will be placed to warn winter users of the change in the trail condition due to vehicle traffic.

### ***Induced seismicity***

The Induced Seismicity Mitigation Plan for the Newberry EGS Demonstration was included as part of the design features during analysis and is incorporated by reference in this Decision. This document is included in Appendix A of the EA. A summary of the key induced seismicity mitigation measures are presented here. Please refer to Appendix A for a more in depth explanation of Magnitude (M) and other terms discussed below.

1. A 500 meter buffer will be maintained between the created reservoir and rocks under the Newberry National Volcanic Monument (NNVM).
2. Hydroshearing operations will be constantly monitored by the microseismic array and a seismologist will prepare daily activity reports for transmittal to the DOE, BLM, FS and others showing seismic event magnitudes plotted versus depth and distance from the stimulation well. These reports will be transmitted to designated third parties (e.g., DOE and BLM) by 11:00 am each day.
3. Contact names and e-mails will be provided in the Conditions of Approval attached to the Sundry notice that approves this phase of the Project.
4. Storage water tanks will be installed on the well pad prior to stimulation to keep sumps on both pads empty to allow for flow back water.
5. A minimum of two feet of freeboard shall be maintained in the sumps. After taking samples and testing the fluids, if they are within acceptable standards, as determined by the State of Oregon Department of Environmental Quality (DEQ), the fluids will be evaporated with the aid of sprinklers positioned on the well pad.
6. If the fluids are not within acceptable standards, the fluid will either be reinjected or pumped from the sump and hauled off site and off National Forest to an appropriate waste disposal site.
7. Mitigation actions will be triggered when induced seismicity exceeds predefined limits in any one of the following categories:
  - a. EGS reservoir growth outside the target stimulation zone or toward undesirable locations.
  - b. Seismic event magnitudes in the reservoir that could lead to larger events.
  - c. Shaking that could disturb visitors or threaten structures in Newberry National Volcanic Monument.
  - d. Microseismic events further than 1000 meters horizontally from the stimulation well.

- e. A seismic event with  $M > 1.0$  or that can be picked on 5 or more MSA seismograms and is located shallower than 6000 feet (1.8 kilometer) below the ground surface at the stimulation well site.
8. A confirmed outlier (defined as any seismic event between one and 3 km from the midpoint of the open-hole interval of NWG 55-29) with a magnitude greater than or equal to 2.0 will result in the use of diverter to shift stimulation to another zone. A confirmed outlier with a magnitude less than 2.0 will require a second confirming event (of any locatable magnitude) to trigger use of a diverter. Any planned increase in flow rate will be postponed until after the diverter is applied. The MSA radius is three km, making location and magnitude determination for events outside this area unreliable. Larger magnitude events can be detected by the PNSN regional network. For outliers exceeding the M 2.7 and M 3.5 magnitude triggers, the mitigation action for the magnitude limits will be used.
  9. Any confirmed outlier within 500 meters (1640 feet) of the NNVM boundary will result in the use of a diverter to shift stimulation to another zone. Any planned increase in flow rate will be postponed until after the diverter is applied.
  10. Any seismic event with  $M > 1.0$  or that is picked up on six or more stations of the MSA that is located shallower than 6000 feet (1.8 km) below the ground surface at the stimulation well will result in use of a diverter to shift stimulation to another zone. Any planned increase in flow rate will be postponed until after the diverter is applied.
  11. After the decision to use diverter is made it may take up to four hours to prepare the diverter and apply it at the depth where diversion is required. Two diverter applications may be necessary to completely seal a fracture zone. Therefore, eight hours may be required to determine whether diversion has succeeded. If growth into an undesired location continues eight hours after the event that triggered the diversion, the flow rate will be decreased as described below.
  12. The stimulation plan is to increase flow rate every two hours as long as the seismic response is safe and the pressure remains lower than formation tensile failure and casing burst pressures. However, the flow rate and wellhead pressure will not be increased for at least 24 hours if one or more events with  $M$  greater than or equal to 2.0 and less than 2.7 are located within the MSA radius (3 km). If a constant flow rate is leading to increasing pressure, keeping the wellhead pressure from increasing might require reducing the flow rate.
  13. Any ground motion recorded on the Paulina Lake strong motion sensor (SMS) with a peak ground acceleration (PGA) greater than 0.014 g that can be correlated in time to a seismic event will result in a reduction of flow rate. In addition, any seismic event with  $M$  greater than 2.7 and less than 3.5 and occurring within the three km (1.9 mile) radius of the MSA, as determined by the PNSN regional network or the MSA, will also result in a reduction of flow rate. The injection rate will be decreased so that the downhole pressure is reduced by 250 pounds per square inch (psi). If events with  $M$  greater than or equal to 2.0 continue to occur, the injection rate will be further decreased to achieve an additional 250 psi reduction. If more than 24 hours passes without  $M > 2.0$  events,

the flow rate may be gradually increased over a 24 hour period back to the rate prior to the triggering event. Beginning at this action level, instructions to report damage will be made available on the Project websites. In addition to the written trigger reports, phone calls will be made to inform key personnel at the Technical Organizations and local Emergency Dispatch listed in Sundry Notice. In cooperation and prior agreement with the Forest Service, AltaRock will notify park visitors, users of Road 500 to Paulina Peak, and owners and users of NNVM assets (e.g., lodges and cabins) regarding the potential for induced seismicity, shaking, slope instability and other possible disturbance, and limit access to certain areas as agreed in advance with Forest Service personnel.

14. Any ground motion recorded on the Paulina Lake SMS with a PGA greater than 0.028 g that can be correlated in time to a seismic event within the 3 km (1.9 mile) aperture of the MSA will result in injection being halted. In addition, any seismic event detected within the 3 km (1.9 mile) aperture of the MSA with M greater than 3.5 as determined by PNSN or the MSA, will also result in injection being halted. After injection is stopped, the well will be immediately flowed to surface test equipment to relieve reservoir pressure (see Section 4.6 of ISMP). Sufficient sump capacity will be available to store at least 10 percent of the injected fluid. Resumption of stimulation will be made only after consultation and agreement between AltaRock, DOE, BLM and the Forest Service. In addition to the written trigger reports, phone calls will be made to inform key personnel at the Technical Organizations and local Emergency Dispatch listed in Sundry Notice. In cooperation and prior agreement with the Forest Service, AltaRock will notify park visitors, users of Road 500 to Paulina Peak, and owners and users of NNVM assets (e.g., lodges and cabins) regarding the potential for induced seismicity, shaking, slope instability and other possible disturbance, and limit access to certain areas as agreed in advance with Forest Service personnel.
15. If shaking measured by the SMS reaches  $PGA > 0.05$  g (Appendices I and J of the ISMP), it is possible that some cosmetic damage could occur to structures near Paulina Lake. Instructions and a tentative form to report damage have been developed (Appendix J of the ISMP) and will be made available on the Project websites and to owners and users of NNVM assets. If stakeholders notice new damage to the cabins, buildings, roads, or the dam after a felt, induced event occurs, they will be instructed by the Project hotline, web sites and printed notifications to NNVM asset owners to submit the damage report within two months of event. A licensed, independent civil engineer, selected with the concurrence of all stakeholders, will evaluate all claims and compare any information collected prior to stimulation (see Section 3.6 of ISMP) to the potential damaged condition, as well as the shaking recorded on the Paulina Lake SMS, and the magnitude of the relevant induced seismic event. Payment for repairs will be based on engineering standards and the measured or inferred shaking, and whether the damage could have been caused by a demonstration Project seismic event or events.
16. Signs will be posted at the beginning of Road 500 for uphill traffic, and on Paulina Peak for downhill traffic, stating "Rock fall hazard ahead. Please contact 855-EGS4USA toll-free (855-872-4347) to report rocks on the road," or alternative text approved by the

Forest Service. The Proponents will work with the Forest Service to ensure that the signs are in place two weeks before the stimulation and remain in place until at least the end of the three-well circulation flow test. A front-end loader and equipment operator will be contracted in advance and on standby in La Pine, ready to remove any debris that falls onto roads from steep road cuts after a felt seismic event. The Forest Service will be notified and will approve of any plans prior to work commencing. Arrangements will be made for a road flagging team to be available to control traffic during any partial or full road closure or during cleanup of the road by the loader. During and for at least two months after the stimulation and flow testing, response will be within two daylight hours after a slide is reported.

17. If stimulation or flow test activities are conducted during the winter, visitors to the area will be warned of an increased risk of snow avalanches. Signs will be posted at snow parks and other entrance points that provide winter access to NNVM. The signs will read "Warning: snow avalanche hazards exist on any slope steeper than 25 percent, including the slopes leading to Paulina Lake and East Lake from the Crater Rim. Skiers and snowmobilers, and geothermal demonstration activities occurring this winter can trigger avalanches on hazardous slopes. Call 855-EGS4USA toll-free (855-872-4347) for more information", or alternative text approved by the Forest Service. AltaRock will work with the Forest Service to ensure that these signs are in place two weeks before the stimulation and remain in place until at least the end of the three-well circulation flow test.

The Proponents will maintain their general liability insurance of \$2,000,000 and a \$1,000,000 limit for each occurrence and umbrella insurance of \$5,000,000 throughout the duration of the Project and until it has been determined the induced seismicity has stopped.

The Forest Service will mark all trees to be cut that are over 8 inches Diameter at Breast Height (DBH) and will be involved in marking the boundaries of the new pads. All trees cut will be left or piled within the immediate area to provide down woody debris.

The Klamath Tribes Director of Culture and Heritage Department and Site Protection Specialist will make a site visit to the project area to determine if any culturally significant areas are present and if so, to assess any potential impacts to those culturally significant areas prior to any ground disturbance being initiated.

## **Rationale for the Decision**

A Finding of No Significant Impact found the action alternatives analyzed in DOI-BLM-OR-P000-2011-0003-EA did not constitute a major federal action that will significantly impact the quality of the human environment. Therefore, an EIS was unnecessary and will not be prepared.

The rationale for approval of this Project includes:

- A. This decision is consistent with the purpose for which lands were leased by the United States to Davenport Newberry Holdings LLC, and which conveyed to Davenport

Newberry the “exclusive right and privilege to drill for, extract, produce, remove, utilize, sell, and dispose of geothermal steam and associated geothermal resources.” To maintain this right, Davenport Newberry must “diligently explore the leased lands for geothermal resources...” applicable to each of these leases.

- B. The Geothermal Steam Act of 1970, as amended, 30 U.S.C. 1001-1028, provides the authority for the BLM to allow for the exploration, development, and utilization of geothermal resources on BLM-managed public lands, as well as geothermal resources on lands managed by other surface management agencies, such as the United States Forest Service.
- C. As a cooperating agency, the Forest Service has fully and actively participated in the environmental analysis process for the Project, has prepared resource analyses for the EA, and has reviewed all studies and documents associated with the NEPA process.
- D. The decision is consistent with surface use stipulations that were made part of the Leases OR40497, OR45505, OR65371, OR12399, OR12437, OR65470, OR45506, OR47300, and OR53085 held by Davenport Newberry Holdings, LLC.
- E. The exploration of the geothermal resource is consistent with initiatives of the National Energy Policy and supports the National Renewable Energy Initiative by providing more information about the energy production from geothermal resources.
- F. No impacts were identified in the EA that will not be adequately mitigated by design features built into the Project including the required Induced Seismicity Mitigation Plan (both summarized earlier in this Decision Record).

Additionally, BLM will monitor the drilling and stimulation procedures and adherence to the Conditions of Approval prepared in the BLM approved Geothermal Drilling Permit (GDP) and Geothermal Sundry Notices (GSN). The GSN’s will be issued in phases. The first phase will be for the construction of MSA stations approved under the jurisdiction of the BLM. The GSN for stimulation (second phase) will be issued when the BLM has received written approval from the DOE that a functioning MSA is installed that meets all requirements of the ISMP and is consistent with the effects (taking into account mitigation) disclosed in the EA and FONSI.

I did not select Alternative B because the analyzed benefits of reduced water usage and a smaller steam plume did not compensate for the projected additional 15,600 gallons of diesel required and increased amount of traffic with its associated noise and disturbance to wildlife. Under the selected alternative, I find that the water mitigation credits purchased by the Proponents, through the Deschutes Groundwater Mitigation Bank, insure there will be no net loss of water to the Deschutes River Basin.

I did not select the No Action alternative because no impacts were identified in the subject EA which couldn’t be adequately mitigated by design features built into the Project. In addition, the proposed action will provide valuable information for future development of geothermal energy utilizing naturally occurring heat in underground rock formations that lack sufficient water, potentially resulting in a new source of renewable energy.

Concerns and topics raised by the public, as well as those raised by the specialists from the cooperating agencies, were used to develop key issues. Key issues encompass those resources potentially impacted by the Project, and include wildlife, scenic resources, groundwater, and the effects of induced seismicity. Organized by those key issues, my further rationale in support of my decision is as follows:

### **Wildlife Key Issue**

Preparing and clearing the vegetation for up to three borehole MSA stations has the potential to remove habitat on these sites for some species. The 0.6 acre area where vegetation will be removed to prepare the three borehole sites is not considered suitable habitat for any Threatened, Endangered, Proposed and Candidate Species, Region 6 sensitive species. (EA page 93-97 and BE) These sites do not provide nesting habitat for raptors, but may provide some form of habitat for certain Management Indicator Species (MIS) such as hiding cover for deer or cover for American marten or bird species. The total area of temporary habitat removal at each site will have a minimal impact on overall habitat for MIS species. These sites will be rehabilitated by the Proponent to Forest Service specifications once they are no longer needed.

Drilling activities, testing and stimulation activities, and an increase in human disturbance also has the potential to disturb raptor nesting sites up to ½ mile away during the breeding season or temporarily displace some wildlife species for up to two years. The magnitude and intensity of the induced seismic events are anticipated to cause minimal temporary disturbance or displacement to nesting birds or large mammal species. Nest abandonment/failure or bird mortality is considered unlikely. (EA page 93)

Measures outlined in the induced seismicity mitigation plan (Appendix A) are designed to mitigate induced seismic events and their associated effects to wildlife. The mitigation plan requires a wildlife biologist to review the operation if nesting raptors are located within ½ mile of any of the activity sites and make a determination if drilling will need to be timed to not occur during the breeding season (EA page 96).

### **Scenic Resources Key Issue**

Removal of vegetation on the microseismic monitoring sites has the potential to cause up to three separate areas of 9,375 square feet (0.2 acre) each, with a total of 28,125 feet or 0.6 acres to not meet the Forest Plan standards for visual quality as seen from selected viewpoints. Depending on weather, the venting of steam during the short and long term circulation tests may also create a steam plume visible at times from certain selected viewpoints. The plumes would be least visible on warm, windy or cloudy days and most visible on cold, clear days. The circulation tests are estimated to take approximately two months to complete and the steam plumes could be visible over this time. Since these impacts are of short duration and intensity, the impacts to a forest visitor will be similar to that experienced from a small prescribed fire, which is common within and around the surrounding landscape and typically occurs during the same time period (EA page 112).

The drill rig and circulation testing facilities may be visible at times from some key viewer locations during the anticipated 2-year duration of the Project. The drill rig on the existing well pad (Well 55-29) will likely be visible from higher viewpoints in the area including Paulina Peak, the viewpoint with the greatest number of visitors annually. Very little, if any, of the Project facilities and activities will be seen by average visitors at any of the six key visual observation points (VOP) primarily due to the very small scale of the Project (less than 0.6 acre of new ground disturbance) and its relationship to the surrounding landscapes that have Moderate to High Visual Absorption Capability. Some activity could be noticed from Paulina Peak and McKay Butte under certain circumstances, such as when a well or circulation test facility is venting on a clear day. The Project is in compliance with Forest Plan direction and Scenic Management Objectives for both General Forest and Scenic Views management areas. Once the Project activities in Alternative A are completed, disturbed areas are not likely to be noticeable to average visitors at any of the six key VOPs. The steam plume will no longer exist, and the Project Proponent will plant trees where necessary to feather edges of the created openings at the three new borehole sites, further reducing any line, texture, or color contrast.

### **Groundwater Key Issue**

Withdrawal of groundwater from water wells for the development and testing of a belowground EGS reservoir has the potential to reduce the quantity of water available for other uses within the Deschutes drainage basin. The direct effects on the groundwater resource are the anticipated temporary drawdowns near the existing water supply wells. Previous pumping tests on the water supply well at the stimulation well pad have provided some preliminary information on aquifer properties and the direct effects that could occur during the Project. The most recent pumping test at the stimulation well had no measurable effect upon the water level in the nearest observation well (the water well at S-16, 1.8 miles away). Aquifer testing indicates a relatively steep cone of depression around the water supply well and a small (less than 2,500 feet) radius of influence (amount of water level drawdown as one moves away from the well) (Appendix B p. 7). While the test was of shorter duration than the length of time the well will be pumped during stimulation, the hydrologist report concludes that the water well appears to be supportive of prolonged pumping durations and that the aquifer appears to be adequate to supply sufficient water for the Project. (Appendix B p. 8-9).

Given that the closest water well is one mile away (a water well owned by the Proponents that will be used to monitor groundwater levels), no direct impacts to groundwater quantity in the immediate area are anticipated (EA page 119).

Although the development and testing of a belowground EGS reservoir has the potential to negatively impact groundwater quality within an aquifer, the EA analysis shows that the risk of development of a hydraulic connection between the proposed EGS reservoir and the shallow (project site) aquifer is extremely low (EA page 121-122). The planned EGS reservoir will be created at depths of 6,500 to 10,000 feet below ground. The network of fractures will extend approximately 1,500 feet radially. If these fractures extended upward from the top of the EGS reservoir zone, it would be several thousand feet below the bottom of the local and regional

aquifers. Given the very low permeability of the receptor rock throughout the length of the vertical borehole below the regional aquifer, there is little chance that fluids would be able to migrate vertically during the testing period.

Both the existing well and the two production wells to be drilled will be cased and cemented per BLM and the Oregon Department of Geology and Mineral Industries (DOGAMI) regulations in order to prevent any chemicals from entering the groundwater. The existing well is relatively young and had a positive casing integrity test conducted in 2008. The caliper survey in 2008, temperature surveys in 2008 and 2010, and the maximum pressure profile achieved during the inject-to-cool operation in 2010, indicate the casing has retained its integrity. This will both protect groundwater resources and prevent degradation of the geothermal production fluid within the well bore (EA page 126).

The diverters and tracers have been found by independent experts to not be harmful to groundwater in the concentrations that they will be used. BLM and independent experts have reviewed the Material Safety Data Sheets (MSDS) for all chemicals proposed to be utilized. None of the proposed chemicals are toxic in the concentrations at which they will be used, and none combine to create toxic materials (memos from Dr. Apblett and Dr. Wheatcraft). Therefore, materials injected as part of the EGS demonstration will not have an effect on groundwater quality in the regional aquifer.

### **Induced Seismicity Key Issue**

The development of a below-ground EGS reservoir by hydroshearing has the potential to produce induced seismicity and increased seismic risk that could affect historic structures, resorts, and other recreation sites within the Newberry National Volcanic Monument (NNVM). Induced seismicity also could increase avalanche risk, could increase risk to above and below ground geologic features and could result in weak shaking in nearby population centers of La Pine, Sunriver, and Bend.

Ground shaking is predicted to be localized just around the stimulation well (Appendix A). The ground shaking is expected to be predominantly high frequency in content and short in duration, making it unlikely to be damaging to the structures within the NNVM (EA page 134).

The combined conclusions of two different independent engineering analyses indicate that:

- The probable upper-bound maximum magnitude of an induced seismic event at Newberry is M3.5-4.0.
- The probability of a seismic event with magnitude between M3.0 – 4.0 is less than one percent.
- There is no difference in seismic hazard between natural seismicity and the hazard introduced by EGS induced seismicity.
- Mitigating measures outlined in Appendix A and Section 4.4 call for decreased flow at detection of events M2.7 to 3.4 and then stop injection and flow the well to the surface to relieve pressure at detection of events equal to or higher than M3.4.

- If an M3.5 seismic event did occur, the potential for damage at the nearest structures within the NNVM will be low.

## Public Involvement

Scoping for this Project began with a postcard and press release on October 22, 2010. A 30-day public review and comment period on the EA ended January 25, 2012. The BLM received 11 comment letters on the EA. These letters were from the Klamath Tribe, Region 10 of the Environmental Protection Agency, the National Environmental Defense Center, Oregon Wild, Central Oregon Land Watch, Blue Mountain Biodiversity Project, Leaning Pine Ranch, and four individuals. The BLM prepared a summary of substantive comments and BLM responses to those comments.

## Project Funding and Timing

**US Development of EGS Technology** – Under the American Recovery and Reinvestment Act of 2009 (ARRA), the Department of Energy (DOE) has provided \$21.4 million in financing for the AltaRock Newberry EGS demonstration project. The project represents the Department of Energy's largest investment in geothermal technology. The Newberry project is one of only a small number of EGS technology demonstrations in the world (projects are underway in China, England, Australia, France, Germany, and other locales); it is highly visible in both the United States and internationally as a cutting edge research project with the potential to demonstrate the viability of EGS as a renewable energy resource. Additionally, AltaRock's collaborations with both domestic and international geothermal research communities are integral to the validation of other EGS related technology developments. Delays in the permitting process could impact the advancement of this technology. By providing timely financial support for EGS technologies, DOE will further its mission to increase national energy options, reduce vulnerability to energy disruption and increase the flexibility of the market to meet U.S. energy needs.

**Project End Date:** The current end date for the AltaRock Newberry award is 9/30/2014. These are ARRA award funds and will expire on 9/30/2015 without an option for an extension. Recently, the Office of Management and Budget (OMB) released guidance to accelerate funding to expend ARRA funds by 9/30/2013. Substantial delays in the permitting process could therefore put the availability of those funds - and therefore the viability of the project – at risk.

**Project Cost Share/Financing:** AltaRock's \$22.3 M cost share for the project is derived from private investment financing that is highly dependent on meeting investor timeline/goals. The majority of the private investment is based on AltaRock's innovative stimulation methods. AltaRock has already lost a portion of private investment since the stimulation has not been conducted within the time frame required of earlier investors. Further delays will lead to the loss of additional investors leaving AltaRock with inadequate cost share contribution to support the DOE award, causing Project termination.

**Project Task Schedule:** If the FONSI/DR is signed in late April 2012 and AltaRock begins Phase II work immediately, preparatory work during the spring and summer (drill MSA boreholes; install, calibrate, and monitor surface and borehole MSA; install strong motion sensor near Paulina Lake Visitors Center, and mobilize stimulation equipment) will allow for stimulation in late summer 2012. The stimulation and flow test are scheduled to be completed in approximately 44 days, in early fall 2012. Any substantial delay from this schedule will likely preclude the stimulation from occurring during the FY 2012 field season due to the onset of inclement weather. If the stimulation does not occur during FY 2012, it is unlikely that AltaRock will be able to complete the project due to the expiration of the ARRA funds and the loss of additional investors.

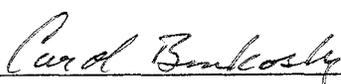
## Protest and Appeal Opportunities

This decision may be appealed to the Interior Board of Land Appeals, Office of the Secretary, in accordance with the regulations contained in 43 CFR 3265.1, 43 CFR, Part 4 and Form 1842-1. If an appeal is filed, your notice of appeal must be received in the Prineville District Office, 3050 NE Third Street, Prineville Oregon, 97754 within 30 days of receipt of the decision. The appellant has the burden of showing the decision appealed is in error.

This geothermal management decision is issued under 43 CFR Parts 3250 and 3261 and is immediately effective and will remain in effect while appeals are pending unless a stay is granted in accordance with § 4.21(b) of this title. If you wish to file a petition for Stay, pursuant to regulation 43 CFR 4.21, for a stay of the effectiveness of this decision during the time your appeal is being reviewed by the Board, the petition for stay must accompany your notice of appeal. A petition for stay is required to show sufficient justification based on the standards listed below. Copies of the notice of appeal and petition for a stay must also be submitted to each party named in this decision and to the Interior Board of Land Appeals and to the appropriate Office of the Solicitor (see 43 CFR 4.413) at the same time the original documents are filed with this office. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted.

Except as otherwise provided by law or other pertinent regulation, a petition for a stay of a decision pending appeal shall show sufficient justification based on the following standards:

1. The relative harm to the parties if the stay is granted or denied.
2. The likelihood of the appellant's success on the merits.
3. The likelihood of immediate and irreparable harm if the stay is not granted.
4. Whether or not the public interest favors granting the stay.

  
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Carol Benkosky  
Prineville District Manager

  
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Date