



*The Snake River Geothermal Consortium*

*is a research partnership focused on  
advancing geothermal energy, hosted  
by Idaho National Laboratory.*

# Updated Permitting Inventory

May 2016



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## **Updated Permitting Inventory**

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**May 2016**

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**Hosted by Idaho National Laboratory**  
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## ACRONYMS

BLM	Bureau of Land Management
DOE	U.S. Department of Energy
DOE-ID	Department of Energy Idaho Operations Office
CRMP	Cultural Resource Management Plan
EA	environmental assessment
FONSI	finding of no significant impact
FORGE	Frontier Observatory for Research in Geothermal Energy
GRRR	Geothermal Resource Research Area
IDWR	Idaho Department Water Resources
INL	Idaho National Laboratory
NGO	non-governmental organization
SHPO	State Historic Preservation Office
SOX	Stand-Off Experiment
SRGC	Snake River Geothermal Consortium



## Updated Permitting Inventory

### 1. SURFACE OWNERSHIP

The site for the Frontier Observatory for Research in Geothermal Energy (FORGE) will be located within the boundaries of the Idaho National Laboratory (INL) Site. The INL Site is located on the Snake River Plain in southeastern Idaho and includes portions of five Idaho counties: Butte, Bingham, Bonneville, Clark, and Jefferson. The INL Site is 26 km (16 mi) northeast of Craters of the Moon National Monument, 113 km (70 mi) southwest of Yellowstone National Park, and 69 km (43 mi) northwest of the Fort Hall Indian Reservation (Figure 1.) Several facility areas are located across 2,305 contiguous km<sup>2</sup> (890 contiguous mi<sup>2</sup>) of otherwise undeveloped, desert terrain. Each of these facility areas takes up less than 5.2 km<sup>2</sup> (2 mi<sup>2</sup>). Kilometers of undeveloped land separate most of these developed areas. INL has dedicated approximately 110 km<sup>2</sup> (42.6 mi<sup>2</sup>) as the Geothermal Resource Research Area (GRRA), a contiguous parcel of secure U.S. Department of Energy (DOE) land. Located adjacent to the western boundary of the INL Site (see Figure 1), the GRRA has significant existing power transmission lines, roads, seismic monitoring, and year-round access while remaining far removed from population centers (Figure 2). The GRRA is entirely in Butte County and has strong community support. FORGE will be located within the GRRA and operated by the Snake River Geothermal Consortium (SRGC).

**NOTE:** All distances to and from the project area are approximate and were measured from the planned location of the FORGE operations pad within the proposed project area. Distances were measured to the nearest point of each landmark, city, or other location. The terms “nearby” and “in the vicinity of” are defined as a distance of less than 113 km (70 mi) from the planned location of the operations pad.

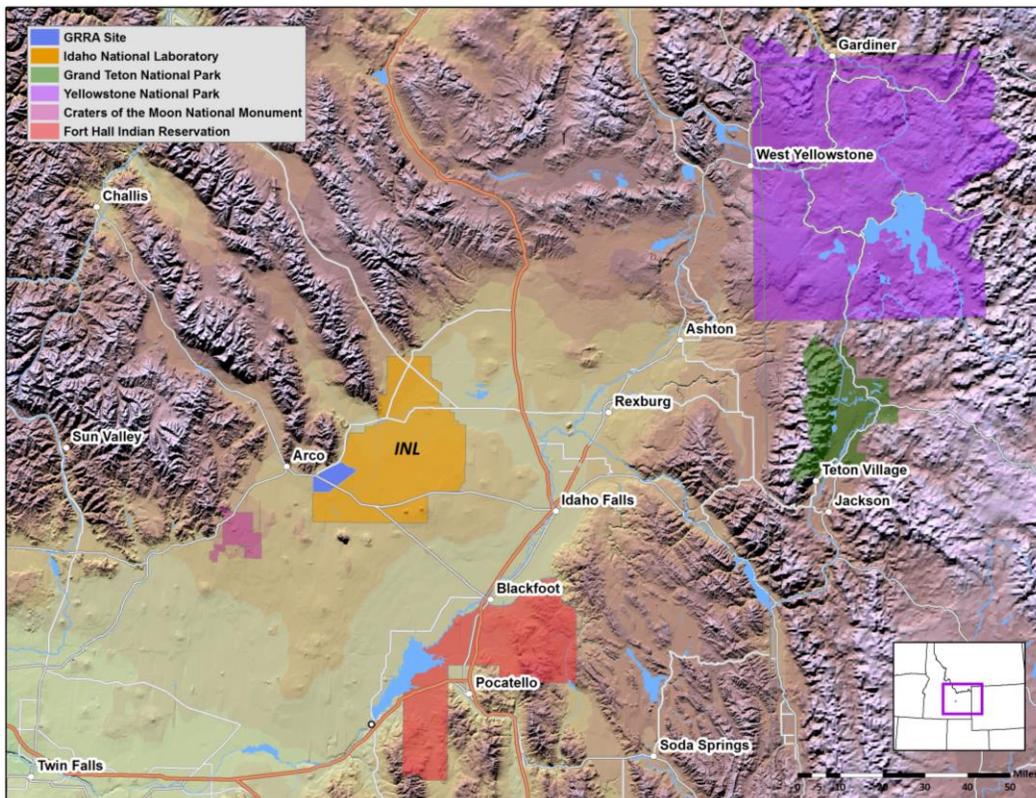


Figure 1. Map showing the INL Site and GRRA in relation to southeast Idaho and surrounding features such as national parks, a national monument, an Indian reservation, and cities.

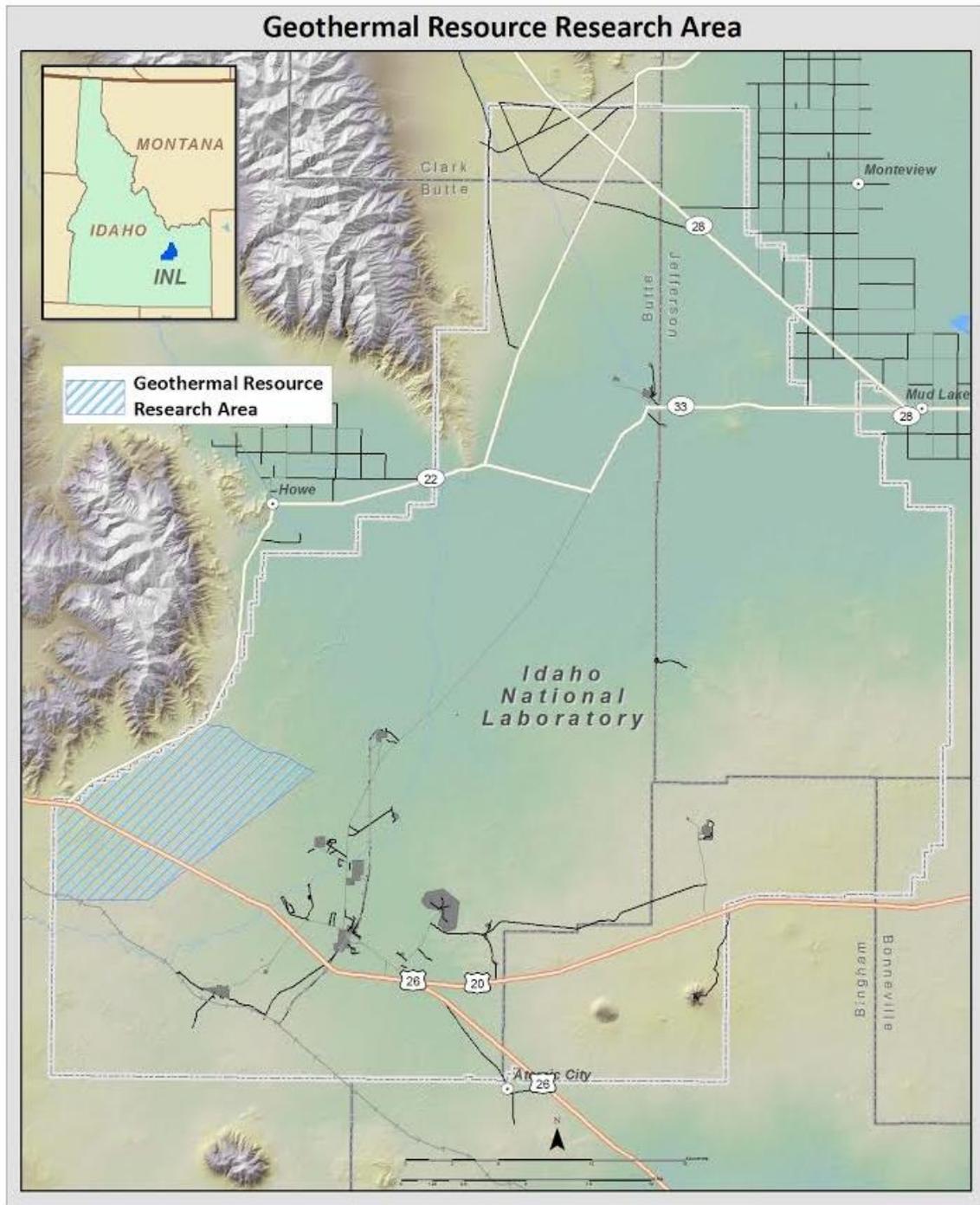


Figure 2. INL Site map showing the GRRRA in relationship to the INL boundary, facility areas, roadways, and surrounding landforms.

## 2. ENVIRONMENTAL AND CULTURAL CONDITIONS

### 2.1 Existing Environmental Activities

In advance of any activities that may impact INL Site resources, we will comply with all applicable environmental laws and requirements. DOE has completed several environmental documents and studies at INL, and these will serve as a resource for the project’s environmental review:

- **Environmental impact statements completed.** DOE has prepared more than 20 environmental impact statements that included actions involving INL.
- **Environmental assessments (EAs) completed.** DOE has prepared more than 35 EAs covering many actions on the INL Site.
- **Environmental studies performed in area.** DOE environmental contractors have conducted numerous studies on the INL Site, including studies on fauna and flora, cultural resources, and natural resources.

### 2.2 INL Environmental Assessment Summary

Table 1 summarizes three recent EAs done on the INL Site and shows project scope, potential issues, and the time it took to complete them. The majority of potential issues relate to cultural and biological resources and the release of radionuclides. However, in all cases, DOE was able to prepare a contiguous (FONSI) for all three EAs. In other words, DOE was able to control or mitigate all potential environmental impacts.

Table 1. Summary of three recent EAs at INL.

EA Title	Scope	Issues/Concern	Time to Complete/Comments
Final EA for the Idaho National Laboratory Stand-Off Experiment (SOX) Range (DOE/EA-1822)	Resume testing of nuclear fuels and materials under transient high-power test conditions at the Transient Reactor Test (TREAT) Facility at INL.	Shoshone-Bannock Tribes: The area of interest did not feature prominent cultural resources and is a previously disturbed site. There were no significant issues. The Tribes were briefed on the nature of the mission and importance of developing nuclear-material-detection capability for the prevention of nuclear terrorism.  Ecological Resources: No significant issues were expected for the location of interest. The Idaho Department of Fish and Game and local conservation groups may have had concerns regarding sage grouse if they had been identified through ecological surveys in the area under consideration.  Public: No significant issues were expected. DOE: No issues were known or anticipated.	EA Determination signed by DOE on July 21, 2010. Final EA/FONSI signed March 8, 2011. 156 work days.

Table 1. (continued).

EA Title	Scope	Issues/Concern	Time to Complete/Comments
<p>Final EA for the Idaho National Laboratory Radiological Response Training Range (DOE/EA-1776)</p>	<p>Construct and operate a new SOX Range. The SOX Range would be used to perform research, development, testing, and evaluation in support of stand-off detection of nuclear and other illicit materials using high-energy linear accelerators.</p>	<p>Public: It was assumed the public would be concerned with the intentional dispersal of radionuclides outdoors. This concern was minimized by clearly explaining the short-term nature of the radioactivity and time required to return to background levels. Furthermore, the purpose and need were clearly explained along with the importance of the activity for U.S. national security and the potential benefit in training and preparing state and local emergency responders.</p> <p>Shoshone-Bannock Tribes: The Tribes may have been concerned with the intentional dispersal of radionuclides and ancillary activities that could impact any undisturbed areas where training activities could take place. These concerns were minimized by clearly explaining the short-term nature of the radioactivity and time required to return to background levels and by being proscriptive about any activities that would occur outside of disturbed areas. The Tribes were briefed on the nature of the mission and importance of the activity for preparing emergency responders and maintaining national capability to respond to nuclear terrorism.</p> <p>Ecological Resources: No significant issues were expected for the locations of interest. The Idaho Department of Fish and Game and local conservation groups may have had concerns regarding sage grouse if they had been identified, through ecological surveys, in any of the areas under consideration.</p> <p>DOE: Other sites may have taken some interest in this action. It was expected that no other DOE site would meet the requirements identified to accomplish the program objective, particularly the need to be able to produce short-lived radionuclides in close proximity to the selected location.</p>	<p>EA Determination signed by DOE on April 13, 2010.</p> <p>Final EA/FONSI signed October 13, 2010.</p> <p>127 work days.</p>

Table 1. (continued).

EA Title	Scope	Issues/Concern	Time to Complete/Comments
Final EA for the National Security Test Range (DOE/EA-1557)	The proposed action consisted of consolidating all INL National Security systems testing activities at one centralized location that can accommodate the increased explosives weights and eliminate scheduling conflicts. The proposed test range was specifically designed and constructed to accommodate testing activities in support of analyzing the effects of explosives and explosive devices, munitions, and similar items on security systems, facilities, vehicles, structures, and other materials.	Cultural/Historical Resources: Establishing the test range may have adverse impacts on subsurface cultural resources, but procedures have been specified that would minimize impacts.  The INL coordinated with the U.S. Fish and Wildlife Service to eliminate or reduce impacts to migratory bird populations known to migrate through the INL Site.	EA Determination signed by DOE on February 2, 2006.  Final EA/FONSI signed April 12, 2007.  299 work days.

### 2.3 Nearby Population Center Density

Population centers in the region include cities greater than 10,000, such as Idaho Falls, Pocatello, Rexburg, and Blackfoot, located more than 48 km (30 mi) to the east and south of the FORGE site, and several smaller cities/communities of less than 10,000 located around the INL Site, about 1 to 48 km (0.6 to 30 mi) away, such as Arco, Howe, Mud Lake, the Fort Hall Indian Reservation, and Atomic City. No permanent residents reside on the INL Site (Figure 3).

Nearby Population Centers and Distances from the Proposed Project Area					
Arco	19 km (12 mi)	Fort Hall	79 km (53 mi)	Mud Lake	57 km (35 mi)
Atomic City	25 km (15 mi)	Howe	25 km (15 mi)	Rexburg	108 km (67 mi)
Blackfoot	73 km (45 mi)	Idaho Falls	85 km (53 mi)	Butte City	13 km (8 mi)



preserve natural resources and sagebrush steppe habitat. The reserve lies 26 km (16 mi) northwest of the project area.

Currently, no species that live on the INL Site are listed as endangered or threatened; however, the greater sage-grouse is identified as a candidate species by the U.S. Fish and Wildlife Service. A final determination on listing it as an endangered species is expected in 2015. As a proactive step, INL has entered into a Candidate Species Conservation Agreement with U.S. Fish and Wildlife Service.

Within the GRRA are several known greater sage-grouse leks (areas where sage-grouse display and mate). However, the FORGE area and activities will not encroach on the leks. Figure 4 shows the Sage-Grouse Conservation Area and locations of sage-grouse leks that were classified as active following the 2015 breeding season.

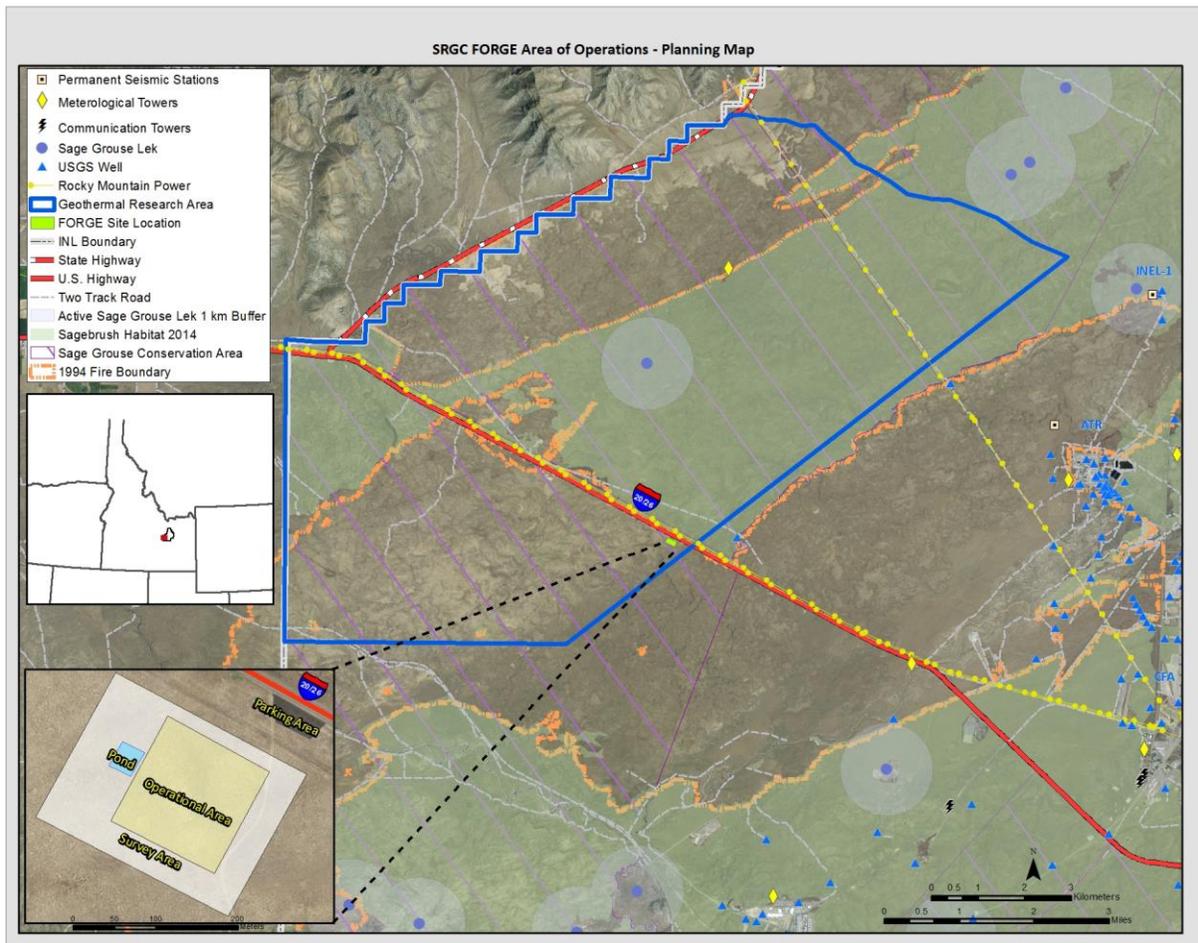


Figure 4. Map of the GRRA and project area (see inset) showing the Sage-Grouse Conservation Area and sage-grouse leks (classified as active following the 2015 breeding season) in relationship to power lines, roads, and nearby INL facilities, i.e., the Advanced Test Reactor (ATR) and Central Facilities Area (CFA).

## 2.5 Nearby Scenic Vistas

Craters of the Moon National Monument and Preserve is located 22 km (14 mi) southwest of the project area and provides views of vast lava flows that erupted from the Great Rift. Big Southern Butte is a National Natural Monument that rises approximately 762 vertical m (2,500 vertical ft) above the lava plain. Bit Southern Butte is 20 km (12 mi) south of the project area and provides a 360-degree view of the high desert terrain. Two designated scenic byways are near the project area. Sacajawea Historic Byway begins at the intersection of Interstate 15 and Idaho Highway 33 at Exit 143 and ends in Salmon, Idaho. Its closest point from the project area is 53 km (33 mi) to the northeast. Peaks to Craters Scenic Byway begins near Craters of the Moon and ends at the junction of U.S. Highway 93 and Idaho Highway 75 and provides views of wetlands, high mountain desert, expansive lava flows, and the Lost River Range. Its closest point to the project area is 20 km (12 mi) to the southwest.

## 2.6 Nearby Areas of Critical Environmental Concern or Wilderness Areas

The North Menan Butte is publicly owned and has been designated as a National Natural Landmark and a Research Natural Area by Congress. The BLM designated the North Butte as an Area of Critical Environmental Concern because of its connection to the geological history of the area. The North Menan Butte lies 92 km (57 mi) to the east of the project area and will not be impacted by the activities on the GRRR.

## 2.7 Nearby Wetlands or Scenic Waterways

Surface waters on or near the INL Site include the Big and Little Lost rivers and Birch Creek. Both the Big Lost River and Birch Creek flow onto the INL Site on an irregular basis. Because of high infiltration losses and large irrigation diversions, the Little Lost River is unlikely to flow onto the INL Site.

Mackay Reservoir, located about 73 km (45 mi) upstream from the INL Site, stores water from the Big Lost River for irrigation. Most of the water stored in the reservoir and most tributary inflow between the reservoir and Arco, Idaho, are diverted for irrigation or lost by infiltration through the channel bottom. Water flowing past Arco continues to infiltrate through the channel bottom before reaching the INL Site. Water that does reach the INL Site terminates at the natural infiltration sinks and at a series of manmade infiltration areas.

Birch Creek has several diversions for irrigation and one diversion to a power-generation facility. Similar to the Big Lost and Little Lost rivers, a significant amount of Birch Creek's flow is lost to infiltration. Birch Creek flows onto the INL Site during the winter months and typically terminates at a gravel pit on the north end of the INL Site.

The Big Lost River is 4.7 km (3 mi) southeast of the project area, and Birch Creek is 46 km (27 mi) to the northeast. The Little Lost River is 23 km (14 mi) to the north. The sinks are located 28 km (17 mi) northeast of the project area. No surface water will be used for FORGE operations.

## 2.8 Nearby Native American Tribes

The nearest Native American tribes are the Shoshone and Bannock, who occupy the Fort Hall Indian Reservation located 73 km (45 mi) southeast of the project area between Pocatello and Blackfoot, Idaho.

The INL Site lies within the aboriginal territory of the Shoshone-Bannock Tribes. In the early 1990s, DOE-ID entered into an agreement with the tribes to allow access to specific INL Site areas for cultural and religious purposes. Subsequent agreements have expanded the mutually beneficial working relationship between the tribes and DOE-ID. The tribal council has been briefed on the FORGE proposal and is supportive. A letter of support from the Tribal Council is attached (Attachment 1).

## 2.9 Potential for Landslides or Excessive Subsidence as a Result of Induced Seismic Activity

The potential for landslides or excessive subsidence as a result of FORGE activities is extremely low. The preliminary FORGE location, as well as the entire GRRRA, is a low-relief plain with no onsite risk of landslides. The FORGE site is 8 km (5 mi) west of the Arco Hills (the only nearby mountains that may have a potential for landslides); thus, the potential for impacts from a landslide as a result of FORGE activities in the Arco Hills is low. There are no mapped surface faults within the GRRRA. In the absence of faults, the near-surface basalts have inherent strength and would resist subsidence.

Figures 5 through 7 show the general landscape characteristics for the proposed FORGE site on the GRRRA. U.S. Highway 20 through the GRRRA, providing year-round all-weather access. The power line visible in Figures 5 and 7 is a 69-kV line owned by Rocky Mountain Power, a PacifiCorp subsidiary.



Figure 5. U.S. Highway 20 running through the GRRRA near the project location (right of highway).



Figure 6. View of the project area (looking south from the U.S. Highway 20) showing typical topography and vegetation in the surrounding area.



Figure 7. View of the project area (looking north and west across U.S. Highway 20) showing typical topography and vegetation in the surrounding area.

## 2.10 Existence of Historic Structures or Identified Cultural Resources in the Immediate Vicinity of the Project Area

A predictive model for prehistoric resources estimates the INL Site contains 75,000 archaeological sites ranging in sensitivity from low to high. To date, approximately 3,000 cultural resources have been identified and recorded. Hundreds of historic archaeological sites also exist across the INL landscape, representing emigration, attempts at homesteading, agricultural development, ranching, and freighting. As of 2006, historians had identified nearly 300 historic structures related to World War II and the nation's early pioneering era. Most of the structures have been deactivated and demolished. There are also areas, plants, and animals of cultural importance to the Shoshone-Bannock Tribes and other local or regional stakeholders (e.g., historic trail organizations). Two sites are listed on the National Register of Historic Places—i.e., Experimental Breeder Reactor I, a National Historic Landmark, and Aviator's Cave. No cultural resources have been identified on the GRRRA.

## 2.11 Potential Issues Associated with the National Historic Preservation Act

The INL Cultural Resource Management Office maintains detailed records of all cultural resource sites identified on INL lands and has developed a statistically based model of prehistoric archaeological

sensitivity in unsurveyed areas to facilitate long-term planning for future projects. These sources have been consulted as part of early project planning and site selection for the GRRRA and have shown that much of the proposed project area is located within an area of low–medium sensitivity for prehistoric archaeological sites. Historic archaeological sites may also be present, particularly along two historic trails now designated as Roads T-2 and T-3, which cross through the proposed project area.

Compliance with the National Historic Preservation Act and other environmental laws related to cultural resources is conducted routinely at INL within the guidelines of the *Idaho National Laboratory Cultural Resource Management Plan* (CRMP; DOE-ID, 2013). The CRMP is legitimized through a 2004 Programmatic Agreement (DOE-ID 2004), “Concerning Management of Cultural Resources on the INL Site,” among DOE-ID, the Advisory Council on Historic Preservation, and the Idaho State Historic Preservation Office (SHPO). The agreement also includes provisions for cooperation with the Shoshone-Bannock Tribes.

Once plans for project developments are finalized and formal surveys/evaluations are completed per the guidelines of the CRMP, a modest number of resources will likely be identified within the GRRRA. Potential adverse impacts to these resources will be avoided or mitigated in consultation with the SHPO and representatives from the Shoshone-Bannock Tribes, according to procedures outlined in the CRMP. For more than a decade, consistent application of the procedures contained within the CRMP has resulted in predictable outcomes for cultural resource assessments and required consultations with the Idaho SHPO and the Shoshone-Bannock Tribes. Early consideration of cultural resources in GRRRA planning efforts should prevent any irresolvable issues related to cultural resources as the project is fully implemented.

## 2.12 Public Support

The SRGC has engaged with the majority of the local communities, such as Idaho Falls, Blackfoot, Arco, Mackay, Salmon, and the Shoshone-Bannock Tribe (Fort Hall), as well as state officials and regional non-governmental organizations (NGOs). An advisory panel formed more than 3 years ago consists of a diverse set of local government leadership, industry, regulators, environmental NGOs, and electric utilities, as well as national and international experts on varying aspects of geothermal energy.

All interactions so far have been positive, with the majority of the community governing bodies, community leaders, and interested citizens providing letters of support that are included in Attachment 1. Supporting letters from state and federal elected officials include the governor of Idaho, as well as the Fort Hall Tribal Council. A total of 33 letters of support from the communities surrounding the proposed FORGE location are included in Attachment 1.

## 3. PERMITTING STATUS

### 3.1 National Environmental Policy Act

The project team has had numerous meetings with regulatory and permitting agencies and has an in-house National Environmental Policy Act group that works very closely with DOE-ID. DOE will require an EA for FORGE that will likely take 8 to 12 months to complete. The EA will identify permitting requirements related to FORGE and other permitting or survey actions as discussed in the following sections.

The National Environmental Policy Act Implementing Procedures (10 CFR 1021) normally require an EA for siting, constructing, operating, and decommissioning energy system demonstration actions. No current EAs or FONSI directly apply to the geothermal demonstration project at INL. At INL, an EA typically takes between 4 and 12 months to complete, with an average of about 8 months. This project will likely take between 8 and 10 months to complete the scoping, draft, public comment, and final phases of an EA.

Following consultations with INL, DOE-ID, and Idaho regulators, the EA will include all FORGE-related activities (including well simulations). No additional permitting activities are expected to be needed to establish FORGE on the INL.

### 3.2 Well Permitting

Several different types of well-drilling permits will be required for FORGE. These are described individually below:

**Groundwater Production Wells.** A drilling permit from Idaho Department Water Resources (IDWR) is required before constructing a groundwater production well to support FORGE water needs. INL has permitted numerous production wells in the past; this as an ordinary part of operations and can be completed without difficulty.

**Monitoring Wells.** Drilling permits are required for monitoring wells for both groundwater and seismic stations in Idaho. INL has negotiated a permitting procedure with the IDWR that allows INL to drill and install wells as needed and without prior notice, permitting wells annually rather than individually. The drilling permit application and applicable fees are submitted by the end of January each year to cover the previous year's drilling and installation. After completing the wells, construction diagrams and well information are submitted to IDWR by the end of June each year (see Attachment 2).

**Geothermal Production Wells.** By statute, INL is required to submit an application at least 20 days before constructing a geothermal well. To facilitate well permitting for an enhanced geothermal system, the SRGC has planned a "Permitting Roadmap" task for later phases of the FORGE operations and has secured technical participation from IDWR staff as part of our SRGC team. During discussions with IDWR personnel to date, they have encouraged us to plan all FORGE operations into the initial permit application (drilling, injection, tracer testing, stimulation), and IDWR has assured us that the permit can be awarded in approximately 90 days.

**Geothermal Injection Wells.** Geothermal injection wells require two permits, one for the geothermal resource and one to inject fluids into the well. SRGC is required to submit an application for each injection well. IDWR recommends submitting the geothermal permit application and injection well application simultaneously. The IDWR also recommends allowing 3 months for permitting an injection well. A public notice will be issued by the IDWR for public comment. The public comment period is a minimum of 30 days. Environmental NGOs have been engaged in regard to our activities and have committed their support for the FORGE site in principle. The Idaho Conservation League, a leading advocate for groundwater and air protection, is represented on the SRGC Advisory Panel. INL has been engaged with the Idaho Conservation League since 2011 regarding geothermal energy and enhanced geothermal systems.

### 3.3 Exploratory Permits

No exploratory permits are required for the FORGE project.

### 3.4 Approved Well Permits

Approved INL well permits are summarized as follows:

- **Well drilled, commercial.** Production/potable water wells have been completed and are active at all the major INL Site facilities.
- **Drilled and not commercial.** Hundreds of monitoring (water level, seismic, water quality, etc.) wells are in operation at the INL Site.

Several observation and monitoring wells are located near but outside the boundary of the GRRR. The USGS will core a groundwater monitoring well near the site selected for FORGE during the summer of

2016. Additionally, a geothermal exploration borehole, INEL-1, is available for monitoring purposes but will require a fitness-for-use evaluation during Phase 2. The locations of these wells are shown on Figure 4.

### 3.5 Permits Pending Approval

No permits associated with FORGE are in process.

### 3.6 Issues of Concern

In the environmental review process, DOE typically encounters a full range of issues related to INL Site activities, including technical, logistical, and social issues related to biological, cultural, and natural resources on the INL Site. In addition, issues related to waste generation, radiation exposure, and water use are frequently part of environmental reviews. In the majority of cases, DOE has demonstrated an ability to resolve and mitigate concerns expressed by federal, state, and local entities and the public.

The public in the region is strongly supportive of hosting the FORGE site at INL. The SRGC has been engaged in public outreach and education for nearly 2 years. Groups that in the past have opposed activities on the INL are supportive of the proposed FORGE efforts.

### 3.7 Mineral Rights

Based on a memorandum of understanding between DOE and BLM regarding mineral rights on the INL Site, there would be no mineral right concerns with drilling wells in the GRRRA or operating FORGE (see Attachment 3).

### 3.8 Lease Status

A geothermal lease is not required for the FORGE site, because FORGE will be located on an existing federal facility. INL has full access to the subsurface. (See Section 4.2.1.)

## 4. WATER AVAILABILITY

### 4.1 Water Availability Onsite

INL has reserved approximately 125 L/s (1,981 gpm) of its 2,250-L/s (35,663-gpm) groundwater right for use for FORGE activities. If needed, additional water is available, because INL currently uses only about 10% of its water rights for all its activities. Groundwater use has never been curtailed on the INL Site due to water right priority.

The SRGC has prepared a “Groundwater Impacts” flyer (see Attachment 4) to educate the local community about the potential impacts to water quality and quantity and has given numerous public presentations regarding FORGE activities. Numerous presentations were also given to the local public on topics that included groundwater issues, as well as induced seismicity. The presentation is included as Attachment 5.

INL is located over the Snake River Plain Aquifer, one of the most prolific groundwater aquifers in the country. The Snake River Plain Aquifer is designated as a sole-source aquifer, but FORGE activities are not anticipated to negatively impact it. INL has extensive groundwater resources available for the project.

A groundwater supply well will be required for the project. The expected depth to water is approximately 180 m (600 ft). The groundwater system is extremely productive, with single wells routinely yielding more than 125 L/s (1,981 gpm), so a single supply well is envisioned for the project.

## 4.2 Water Rights

### 4.2.1 Water Rights Included/Secured with Land/Lease Deal

INL has a federal-reserved subsurface water right with a priority date of April 7, 1950. It is a Federal Reserved Water Right and subject to the terms of the Water Right Agreement between the State of Idaho and the United States for the DOE, dated July 23, 1990. The INL water right determination is included in Attachment 6. No reliable surface water exists on the INL Site.

Groundwater use on the INL Site has never been curtailed due to water-right seniority issues.

### 4.2.2 Other Local Water Demands for Agricultural or other Purpose

The nearest center-pivot irrigation well is approximately 15 km (9 mi) from the project area. INL-related production wells may be located within 10 km (6 mi) of this irrigation well.

## 5. STATE AND LOCAL REGULATIONS

### 5.1 Solid Waste Disposal Standards

#### 5.1.1 Access and Limitations on Waste Disposal

The scope of the FORGE activity will generate solid waste consequent of the exploratory geothermal well and potable well drilling. Materials extracted from the borehole drilling processes must be land-disposed in accordance with federal, state, and local standards. Process materials and expendables may be disposed of at the INL landfill.

This research activity will not generate radioactive waste that requires management under DOE Order 435.1, "Radioactive Waste Management."

#### 5.1.2 Sanitary Wastewater Disposal

Portable toilets will be used at the proposed FORGE site.

### 5.2 Noise Standards

Currently, there are no noise standards related to wildlife on the INL Site. However, depending on noise generated from construction and operation of FORGE, noise standards may be discussed in the EA.

### 5.3 Air Quality Standards

The INL Site is in an unclassifiable area. All new projects are subject to Prevention of Significant Deterioration and New Source Performance Standards review. The INL Site is currently a major source for criteria and hazardous air pollutants. However, it is anticipated that no permanent stationary air emission sources will be constructed at the GRRA, and thus the Idaho regulations that control air pollution will not be applicable to this activity.

### 5.4 Drinking Water and Aquatic Life Protection

Groundwater is the source of drinking water at the INL Site. Public drinking water systems at INL are subject to state drinking water regulations. Regionally, the Snake River Plain Aquifer is designated as a sole-source aquifer; however, this designation in no way affects planning, permitting, or operation of FORGE. The relevant permitting agencies are part of the SRGC.

## 5.5 Compatible Land Use

Portions of the INL Site are leased for livestock grazing. The entire GRRRA lies within several open-range grazing allotments. Project areas within the GRRRA will be small and fenced to exclude livestock.

## 5.6 Acceptable Local Effects of Heat Rejection

There are no known restrictions related to the effects of heat rejection.

## 6. POWER TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE

Two options for electrical power are being evaluated for FORGE operations. Commercial electrical transmission lines are available within approximately 150 m (492 ft) of the FORGE site. A small substation will be required to step down the voltage from transmission to distribution levels. Rocky Mountain Power is engaged and on our advisory panel.

INL power-distribution lines are also available near the FORGE site and are already at distribution voltages. These lines are approximately 5.6 km (3.5 mi) away and have enough capacity to support FORGE operations. Final selection of the power source will be made as part of the detailed infrastructure assessment in Phase 2 of the FORGE project.

## 7. YEAR-ROUND ACCESSIBILITY

The project area is accessible year-round. U.S. Highway 20 is adjacent to the area and maintained by the Idaho Transportation Department. INL Site interior roads run from the highway through the GRRRA and are maintained by INL (Figure 1).

## 8. WEATHER CONDITIONS AT THE INL SITE

Thirty weather stations in and around INL continuously measure meteorological parameters such as temperature, wind speed and direction, precipitation, and humidity. During the summer, days are warm and nights are cool; in winter, days and nights are cold. The limited rainfall, relatively dry air, and infrequent low clouds permit intense solar heating of the surface during the day and rapid radiative cooling at night. The average annual temperature at the INL Site exhibits a gradual 7-month increase beginning with the first week in January and continuing through the third week in July. From April through October, the average monthly temperature varies from 5 to 20°C (41 to 68°F). The temperature decreases over the course of 5 months until the minimum average temperature is again reached in January. During November through March, the average monthly temperature varies from -9 to -1°C (15 to 30°F).

The prevailing wind is from the southwest. Winds from the northeast also are common, especially at night when movement of cool air reverses direction from the daytime flows. The average wind speed at the 6-m (20-ft) height ranges from 8.2 km/hour (5.1 mph) in December to 15 km/hour (9.3 mph) in March and April. The highest hourly-average wind speed at the 6-m (20-ft) level was 108 km/hour (67 mph), and the maximum instantaneous gust at the same level was 125.5 km/hour (78 mph). Strong wind gusts can occur in the immediate vicinity of thunderstorms. On average, these gusts occur 2 or 3 days per month during June, July, and August. Calm conditions prevail 11% of the time.

The average annual precipitation is 21.4 cm (8.4 in.). The highest recorded annual amount of precipitation was 36.6 cm (14.4 in.) in 1963, and the lowest amount was 11.4 cm (4.5 in.) in 1966. The highest precipitation occurs in May and June, with an average precipitation of 3 cm (1.2 in.) for each of these months. Snowfall is a substantial contributor to total annual precipitation and ranges from 17 to 152 cm/year (6.7 to 60 in./year), with an annual average of 70 cm (28 in.). The maximum average monthly snowfall is 16.3 cm (6.4 in.), occurring in December.

## REFERENCES

10 CFR 1021, National Environmental Policy Act Implementing Procedures.

DOE Order 435.1, 1999, Radioactive Waste Management: U.S. Department of Energy.

DOE-ID, 2004, Programmatic Agreement Between the Department of Energy, Idaho Operations Office, the Idaho State Historic Preservation Office, and the Advisory Council on Historic Preservation, Concerning Management of Cultural Resources on the Idaho National Engineering and Environmental Laboratory.

DOE-ID, 2013, Idaho National Laboratory Cultural Resource Management Plan: U.S. Department of Energy Idaho Operations Office, DOE/ID-10997, 441 p.

## ATTACHMENTS

Attachment 1: Letters of Support

Attachment 2: INL-IDWR Monitoring Well Permitting Memo

Attachment 3: Mineral Rights Memorandum of Understanding between DOE-ID and BLM

Attachment 4: Groundwater Impacts Flyer

Attachment 5: Potential Seismic Activity Presentation

Attachment 6: INL Water Rights

## Attachment 1 Letters of Support



C.L. "BUTCH" OTTER  
GOVERNOR

August 26, 2014

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
PO Box 1625  
Idaho Falls, ID 83415

**SUBJECT:** Letter of Support for the proposal: *A Snake River Plain Field Laboratory for Enhanced Geothermal Systems* submitted in response to **Frontier Observatory for Research in Geothermal**, U.S. Department of Energy DE- FOA-0000890

Dear Dr. Podgorney,

It is my pleasure to provide a letter of support for your proposal for *A Snake River Plain Field Laboratory for Enhanced Geothermal Systems* at the U.S. Department of Energy's (DOE) Idaho National Laboratory under the DOE's proposed "Frontier Observatory for Research in Geothermal Energy."

The proposed project will deploy and demonstrate measures necessary to make geothermal energy a significant portion of Idaho's and the nation's energy portfolio.

I have directed John Chatburn, administrator of the Governor's Office of Energy Resources, to actively participate on your advisory panel and provide Idaho's perspective. The work that you are proposing to do will position Idaho to lead technological advances in geothermal energy.

As Always – Idaho, "Esto Perpetua"

A handwritten signature in black ink, appearing to read "C.L. Butch Otter".

C.L. "Butch" Otter  
Governor, State of Idaho

Cc: John Chatburn

# The SHOSHONE-BANNOCK TRIBES

FORT HALL INDIAN RESERVATION  
PHONE (208) 478-3700  
FAX # (208) 237-0797



FORT HALL BUSINESS COUNCIL  
P.O. BOX 306  
FORT HALL, IDAHO 83203

August 29, 2014

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Director, Snake River Geothermal Consortium PO Box  
1625 / MS 2025  
Idaho Falls, ID 83415

Dear Dr. Podgorney,

It is our pleasure to support your proposal to initiate the establishment of the Department of Energy's proposed "Frontier Observatory for Geothermal Energy" (FORGE) Laboratory on the Snake River Plain, hosted at the U.S. Department of Energy's Idaho National Laboratory (INL). Your proposal to develop and test the technologies required to enable widespread adoption of Enhanced Geothermal Systems (EGS) will position Idaho, the region and the nation for sustained growth in a key baseload renewable power-geothermal energy.

It is great to see INL leading a diverse and well-respected proposal team, which includes industry representatives and the Idaho universities that work closely with the INL's Center for Advanced Energy Studies (CAES). A strong university and private-sector contribution to the research will have long-lasting positive impacts for Idaho, as will the education outreach activities you have planned. Your approach will keep Idaho in a position to lead technological advances in geothermal energy and ensure that geothermal power generation will have a stronger presence in the evolution of our renewable energy portfolio well beyond the 21st century.

We support the efforts of INL, CAES, and your collaborators as you seek to establish enhanced geothermal systems and look forward to helping your team in this important effort.

Sincerely,

Nathan Small, Chairman  
Fort Hall Business Council

Cc: file/chron

## BINGHAM COUNTY COMMISSIONERS

A. Ladd Carter, Chairman

Whitney Manwaring

Mark R. Bair



Lynette George, Commission Clerk  
501 N. Maple #204  
Blackfoot, ID 83221  
Phone: 782-3013  
Fax: 785-4131

September 8, 2014

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

Dear Dr. Podgorney,

It is the pleasure of the Bingham County Commissioners to support your proposal to initiate the establishment of the Department of Energy's proposed "Frontier Observatory for Geothermal Energy" (FORGE) Laboratory on the Snake River Plain, hosted at the U.S. Department of Energy's Idaho National Laboratory (INL). Your proposal to develop and test the technologies required to enable widespread adoption of Enhanced Geothermal Systems (EGS) will position Idaho, the region and the nation for sustained growth in a key baseload renewable power—geothermal energy.

It is great to see INL leading a diverse and well-respected proposal team, which includes industry representatives and the Idaho universities that work closely with the INL's Center for Advanced Energy Studies (CAES). A strong university and private-sector contribution to the research will have long-lasting positive impacts for Idaho, as will the education outreach activities you have planned. Your approach will keep Idaho in a position to lead technological advances in geothermal energy and ensure that geothermal power generation will have a stronger presence in the evolution of our renewable energy portfolio well beyond the 21st century.

The Bingham County Commissioners support the efforts of INL, CAES, and your collaborators as you seek to establish enhanced geothermal systems and look forward to helping your team in this important effort.

Sincerely,

A. Ladd Carter, Chairman

Whitney Manwaring, Commissioner

Mark R. Bair, Commissioner

"Potato Capital"



**BUTTE COUNTY COMMISSIONERS**

COURTHOUSE  
P.O. BOX 737  
ARCO, IDAHO 83213  
(208) 527-3021  
FAX (208) 527-3295

SETH E. BEAL  
KENT CUMMINS  
BRIAN HARRELL

September 9, 2014

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

Dear Dr. Podgorney,

It is our pleasure to support your proposal to initiate the establishment of the Department of Energy's proposed "Frontier Observatory for Geothermal Energy" (FORGE) Laboratory on the Snake River Plain, hosted at the U.S. Department of Energy's Idaho National Laboratory (INL). Your proposal to develop and test the technologies required to enable widespread adoption of Enhanced Geothermal Systems (EGS) will position Idaho, the region and the nation for sustained growth in a key baseload renewable power—geothermal energy.

It is great to see INL leading a diverse and well-respected proposal team, which includes industry representatives and the Idaho universities that work closely with the INL's Center for Advanced Energy Studies (CAES). A strong university and private-sector contribution to the research will have long-lasting positive impacts for Idaho, as will the education outreach activities you have planned. Your approach will keep Idaho in a position to lead technological advances in geothermal energy and ensure that geothermal power generation will have a stronger presence in the evolution of our renewable energy portfolio well beyond the 21st century.

We support the efforts of INL, CAES, and your collaborators as you seek to establish enhanced geothermal systems and look forward to helping your team in this important effort.

Sincerely,

Trilby McAfee  
Clerk to the Butte County Board of Commissioners

**CLARK COUNTY IDAHO  
BOARD OF COUNTY COMMISSIONERS**

P.O. Box 205\*320 W. MAIN  
**DUBOIS, ID 83423**  
**(208) 374-5304**

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

Dear Dr. Podgorney,

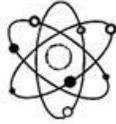
It is our pleasure to support your proposal to initiate the establishment of the Department of Energy's proposed "Frontier Observatory for Geothermal Energy" (FORGE) Laboratory on the Snake River Plain, hosted at the U.S. Department of Energy's Idaho National Laboratory (INL). Your proposal to develop and test the technologies required to enable widespread adoption of Enhanced Geothermal Systems (EGS) will position Idaho, the region and the nation for sustained growth in a key base load renewable power—geothermal energy.

It is great to see INL leading a diverse and well-respected proposal team, which includes industry representatives and the Idaho universities that work closely with the INL's Center for Advanced Energy Studies (CAES). A strong university and private-sector contribution to the research will have long-lasting positive impacts for Idaho, as will the education outreach activities you have planned. Your approach will keep Idaho in a position to lead technological advances in geothermal energy and ensure that geothermal power generation will have a stronger presence in the evolution of our renewable energy portfolio well beyond the 21st century.

We support the efforts of INL, CAES, and your collaborators as you seek to establish enhanced geothermal systems and look forward to helping your team in this important effort.

Sincerely,

  
Gregory Shenton  
Chairman  
Clark County Commissioners



First City in the World  
to be lit by Atomic Power

## City of Arco

P.O. Box 196  
Arco, ID 83213  
Phone (208) 527-8294  
Fax (208) 527-8951



Gateway to the Craters of the  
Moon National Monument

August 26, 2014

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

Dear Dr. Podgorney,

It is my pleasure to support your proposal to initiate the establishment of the Department of Energy's proposed "Frontier Observatory for Geothermal Energy" (FORGE) Laboratory on the Snake River Plain, hosted at the U.S. Department of Energy's Idaho National Laboratory (INL). Your proposal to develop and test the technologies required to enable widespread adoption of Enhanced Geothermal Systems (EGS) will position Idaho, the region and the nation for sustained growth in a key baseload renewable power—geothermal energy.

It is great to see INL leading a diverse and well-respected proposal team, which includes industry representatives and the Idaho universities that work closely with the INL's Center for Advanced Energy Studies (CAES). A strong university and private-sector contribution to the research will have long-lasting positive impacts for Idaho, as will the education outreach activities you have planned. Your approach will keep Idaho in a position to lead technological advances in geothermal energy and ensure that geothermal power generation will have a stronger presence in the evolution of our renewable energy portfolio well beyond the 21st century.

I support the efforts of INL, CAES, and your collaborators as you seek to establish enhanced geothermal systems and look forward to helping your team in this important effort.

Sincerely,

Ross Langseth, Mayor  
City of Arco



City of  
**Blackfoot**

**Paul M. Loomis**, Mayor

157 North Broadway  
Blackfoot, Idaho 83221  
(208) 785-8600  
[www.cityofblackfoot.org](http://www.cityofblackfoot.org)

9 September 2014

To: Idaho National Laboratory  
ATTN: Robert K. Podgorney, PhD, PG  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

Subject: Letter of Support for the "Frontier Observatory for Geothermal Energy"  
(FORGE) Laboratory

Dear Dr. Podgorney:

Please accept my strongest support of the proposed establishment of the FORGE Laboratory at the U.S. Department of Energy, Idaho National Laboratory (INL).

Due to the unique geology of the Snake River Plain it is the logical location for such a study and effort. The development and testing of technologies such as Enhanced Geothermal Systems is needed for our nation and will benefit future generations of Idahoans. Geothermal energy has legitimate potential as a renewable power source.

It is my desire to see INL continue its leadership in developing power / energy technologies for our country. The INL has always been a location that pushes the scientific envelope in the knowledge of power production. I ask the Department of Energy to continue this leadership and entrust the INL team with this effort. Keep Idaho in a position to be proud of the advancement of power generation technology. Geothermal energy and geothermal power generation deserves a stronger development effort and commitment of resources.

Again, I support the efforts of the INL to collaborators with the great minds of our Nation to seek the enhancement of geothermal systems. Please call on me if I can be of assistance in this effort.

Very Respectfully,

Paul M. Loomis  
Mayor  
City of Blackfoot

P. O. Box 133  
Mackay, ID 83251-0133  
September 5, 2014

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

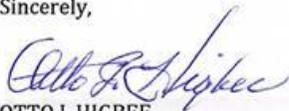
Dear Dr. Podgorney,

It is my pleasure to support your proposal to initiate the establishment of the Department of Energy's proposed "Frontier Observatory for Geothermal Energy" (FORGE) Laboratory on the Snake River Plain, hosted at the U.S. Department of Energy's Idaho National Laboratory (INL). Your proposal to develop and test the technologies required to enable widespread adoption of Enhanced Geothermal Systems (EGS) will position Idaho, the region and the nation for sustained growth in a key baseload renewable power—geothermal energy.

It is great to see INL leading a diverse and well-respected proposal team, which includes industry representatives and the Idaho universities that work closely with the INL's Center for Advanced Energy Studies (CAES). A strong university and private-sector contribution to the research will have long-lasting positive impacts for Idaho, as will the education outreach activities you have planned. Your approach will keep Idaho in a position to lead technological advances in geothermal energy and ensure that geothermal power generation will have a stronger presence in the evolution of our renewable energy portfolio well beyond the 21st century.

I support the efforts of INL, CAES, and your collaborators as you seek to establish enhanced geothermal systems and look forward to helping your team in this important effort.

Sincerely,



OTTO J. HIGBEE  
Board Member of Lost River Economic Development  
Board Member of Lost Rivers Medical Center  
Board Member of Eastern Idaho Community Action Partnership  
Board Chairman of Mackay Senior Citizens Center  
Former Mayor of Mackay



September 10, 2014

Robert K. Podgomey, PhD, PG  
Idaho National Laboratory  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

Dear Dr. Podgomey,

The Bannock Development Corporation wishes to express its support for your proposal to initiate the establishment of the Department of Energy's proposed "Frontier Observatory for Geothermal Energy" (FORGE) Laboratory on the Snake River Plain, hosted at the U.S. Department of Energy's Idaho National Laboratory (INL). Your proposal to develop and test the technologies required to enable widespread adoption of Enhanced Geothermal Systems (EGS) will position Idaho, the region and the nation for sustained growth in a key base load renewable power—geothermal energy.

The nation will derive a more extensive benefit from your research in that geothermal energy could be more extensively developed and employed. Deep well and heat reservoir energy sources could be developed to provide consistent energy sources that are so critical for dependability and feasibility. These dependable green energy sources would be available to a wider population in the US.

It is great to see INL leading a diverse and well-respected proposal team, which includes industry representatives and the Idaho universities that work closely with the INL's Center for Advanced Energy Studies (CAES). A strong university and private-sector contribution to the research will have long-lasting positive impacts for Idaho, as will the education outreach activities you have planned. Your approach will keep Idaho in a position to lead technological advances in geothermal energy and ensure that geothermal power generation will have a stronger presence in the evolution of our renewable energy portfolio well beyond the 21st century.

The Bannock Development Corporation supports the efforts of INL, CAES, and your collaborators as you seek to establish enhanced geothermal systems and look forward to helping your team in this important effort.

Sincerely

A handwritten signature in black ink that reads "John D. Regetz".

John Regetz  
Executive Director  
Bannock Development Corp.

ISU Research and Business Park  
1651 Alvin Ricken Drive  
Pocatello, Idaho 83201  
Phone: (208) 233-3500  
Fax: (208) 233-0268

[www.bannockdevelopment.org](http://www.bannockdevelopment.org)



Growing Business In Southeast Idaho

P.O. Box 1435 • Blackfoot, ID 83221 • (208) 782-3877 • Email: bhulse@co.bingham.id.us

September 4, 2014

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

Dear Dr. Podgorney,

It is our pleasure to support your proposal to initiate the establishment of the Department of Energy's proposed "Frontier Observatory for Geothermal Energy" (FORGE) Laboratory on the Snake River Plain, hosted at the U.S. Department of Energy's Idaho National Laboratory (INL). Your proposal to develop and test the technologies required to enable widespread adoption of Enhanced Geothermal Systems (EGS) will position Idaho, the region and the nation for sustained growth in a key baseload renewable power—geothermal energy.

It is great to see INL leading a diverse and well-respected proposal team, which includes industry representatives and the Idaho universities that work closely with the INL's Center for Advanced Energy Studies (CAES). A strong university and private-sector contribution to the research will have long-lasting positive impacts for Idaho, as will the education outreach activities you have planned. Your approach will keep Idaho in a position to lead technological advances in geothermal energy and ensure that geothermal power generation will have a stronger presence in the evolution of our renewable energy portfolio well beyond the 21st century.

We support the efforts of INL, CAES, and your collaborators as you seek to establish enhanced geothermal systems and look forward to helping your team in this important effort.

Sincerely,

A handwritten signature in black ink that reads "R. Scott Reese".

R. Scott Reese  
Chairman of the Board of Directors

[www.DevelopBingham.com](http://www.DevelopBingham.com)



**Arco-Butte County**  
**Business Incubation Center**

PO Box 0641  
Arco, Idaho 83213

September 7, 2014

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

Dear Dr. Podgorney,

It is our pleasure to support your proposal to initiate the establishment of the Department of Energy's proposed "Frontier Observatory for Geothermal Energy" (FORGE) Laboratory on the Snake River Plain, hosted at the U.S. Department of Energy's Idaho National Laboratory (INL). Your proposal to develop and test the technologies required to enable the adoption of Enhanced Geothermal Systems (EGS) will help position Butte County, Idaho, the region and the nation for sustained growth in a key baseload renewable power—geothermal energy.

We are pleased to see INL leading a diverse and well-respected proposal team, which includes industry representatives and the Idaho universities that work closely with the INL's Center for Advanced Energy Studies (CAES). A strong university and private-sector contribution to the research will have long-lasting positive impacts for Idaho, as will the education outreach activities you have planned. Your approach will keep Idaho in a position to lead technological advances in geothermal energy and ensure that geothermal power generation will have a stronger presence in the evolution of our renewable energy portfolio well beyond the 21st century. We look forward to the time when FORGE will help develop the economy of Butte County and the region.

We support the efforts of INL, CAES, and your collaborators as you seek to establish enhanced geothermal systems and look forward to helping your team in this important effort.

Sincerely,

James Waylow, Chairman  
Arco Butte Business Incubation Center Board of Directors

JW:cc



**EIEDP**  
**PO Box 451**  
**Blackfoot, ID 83221**

August 25, 2014

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

Dear Dr. Podgorney,

It is Eastern Idaho Economic Development Partnership's pleasure to support your proposal to initiate the establishment of the Department of Energy's proposed "Frontier Observatory for Geothermal Energy" (FORGE) Laboratory on the Snake River Plain, hosted at the U.S. Department of Energy's Idaho National Laboratory (INL). Your proposal to develop and test the technologies required to enable widespread adoption of Enhanced Geothermal Systems (EGS) will position Idaho, the region and the nation for sustained growth in a key baseload renewable power—geothermal energy.

It is great to see INL leading a diverse and well-respected proposal team, which includes industry representatives and the Idaho universities that work closely with the INL's Center for Advanced Energy Studies (CAES). A strong university and private-sector contribution to the research will have long-lasting positive impacts for Idaho, as will the education outreach activities you have planned. Your approach will keep Idaho in a position to lead technological advances in geothermal energy and ensure that geothermal power generation will have a stronger presence in the evolution of our renewable energy portfolio well beyond the 21st century.

EIEDP supports the efforts of INL, CAES, and your collaborators as you seek to establish enhanced geothermal systems and look forward to helping your team in this important effort.

Sincerely,

*Kathy Ray*

Kathy Ray  
President, EIEDP



September 16, 2014

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Director, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

Dear Dr. Podgorney,

Grow Idaho Falls is a public-private, non-profit, economic development agency for Idaho Falls, Ammon, Iona, Ucon, and the county of Bonneville. We advocate for advancements in research, education, and industrial advances that will enhance not only our own economic vitality, but those activities that will benefit other regions beyond our borders.

On behalf of our Board of Directors, it is our pleasure to support your proposal to initiate the establishment of the Department of Energy's proposed "Frontier Observatory for Geothermal Energy" (FORGE) Laboratory on the Snake River Plain, hosted at the U.S. Department of Energy's Idaho National Laboratory (INL). This proposal to develop and test the technologies required to enable widespread adoption of Enhanced Geothermal Systems (EGS) will position Idaho, particularly southeastern Idaho, and the nation for sustained growth in geothermal energy. This is especially important to establish geothermal opportunities as a more widespread, renewable, baseload power source.

INL has put together a diverse and well-respected proposal team, which includes industry representatives and the Idaho universities that work closely with the INL's Center for Advanced Energy Studies (CAES). The strong university and private-sector contribution to the research will have long-lasting positive impacts for the entire industry. We believe this approach will keep Idaho in a position to lead technological advances in geothermal energy, as well as ensure that geothermal power generation will have a stronger presence in renewable energy portfolios well into the future.

Grow Idaho Falls, Inc. supports the efforts of INL, CAES, and your collaborators as you seek to establish enhanced geothermal systems and look forward to helping your team in this important effort.

Sincerely,

Dale Lundblade, President

Linda Martin, CEcD, CEO

151 North Ridge, Suite A, Idaho Falls, ID 83402  
PH: 208-522-2014/FX 208-522-3824  
[www.growidahofalls.org](http://www.growidahofalls.org)



803 Monroe Street • Salmon, Idaho 83467 • 208-756-1567 • Fax 208-756-1506

September 5, 2014

Dr. Robert K. Podgorney  
Idaho National Laboratory  
PO Box 1625/MS 2025  
Idaho Falls, ID 83415

Dear Dr. Podgorney,

On behalf of the Board of Directors of the Lemhi County Economic Development Association, Inc. (LCEDA), I submit this letter in support of the Snake River Geothermal Consortium's, field laboratory known as FORGE - Frontier Observatory for Research in Geothermal Energy. LCEDA is a 501c3 organization sponsored by the Lemhi County Commissioners. Our mission is to:

- Promote economic development through business retention, expansion, creation, and recruitment.
- Assist with community development projects that improve the quality of life and stabilize the economy.
- Build partnerships that leverage public, private, and cooperative resources to stimulate rural economic activity.

LCEDA supports efforts for research of new energy sources and technologies. Often those new and emerging efforts are most beneficial to small rural communities who are trying to entice small businesses to their area or assist existing business become more efficient. In communities such as those in the Lemhi Valley (also referred to as frontier communities because of their distance to any population centers) alternative energy sources are important not only for the lower energy costs but also for a redundant power source and additional capacity to support the needs of industry.

The FORGE project also provides for potential jobs in our communities as the technology is adopted and moved into the mainstream.

Please seriously consider the Idaho National Laboratory as an excellent location for this type of research.

Best Regards,

A handwritten signature in blue ink that reads "Alan Howell".

Alan Howell  
Chairman  
LCEDA

---

"Creating economic opportunity through Business Development, Workforce Training & Community Support"



*Lost Rivers*  
Economic Development

August 23rd, 2014

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

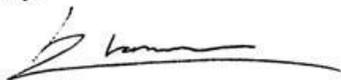
Dear Dr. Podgorney,

It is my pleasure to support your proposal to initiate the establishment of the Department of Energy's proposed "Frontier Observatory for Geothermal Energy" (FORGE) Laboratory on the Snake River Plain, hosted at the U.S. Department of Energy's Idaho National Laboratory (INL). Your proposal to develop and test the technologies required to enable widespread adoption of Enhanced Geothermal Systems (EGS) will position Idaho, the region and the nation for sustained growth in a key baseload renewable power—geothermal energy.

It is great to see INL leading a diverse and well-respected proposal team, which includes industry representatives and the Idaho universities that work closely with the INL's Center for Advanced Energy Studies (CAES). A strong university and private-sector contribution to the research will have long-lasting positive impacts for Idaho, as will the education outreach activities you have planned. Your approach will keep Idaho in a position to lead technological advances in geothermal energy and ensure that geothermal power generation will have a stronger presence in the evolution of our renewable energy portfolio well beyond the 21st century.

Lost Rivers Economic Development supports the efforts of INL, CAES, and your collaborators as you seek to establish enhanced geothermal systems and looks forward to helping your team in this important effort. We are excited to be the host county for the project and offer our assistance to help with the smooth implementation of the project and securing permits if necessary.

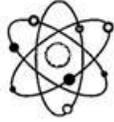
Sincerely,



Candice Larsen  
Executive Director  
Lost Rivers Economic Development

(Butte and South Custer County)

P. O. Box 46 • Arco, Idaho 83213 • Phone: (208) 350-3717 • Fax: (208) 527-3036  
[www.thelostrivervalley.com](http://www.thelostrivervalley.com)



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## City of Arco

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Fax (208) 527-8951



Gateway to the Craters of the  
Moon National Monument

August 26, 2014

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

Dear Dr. Podgorney,

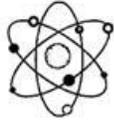
It is my pleasure to support your proposal to initiate the establishment of the Department of Energy's proposed "Frontier Observatory for Geothermal Energy" (FORGE) Laboratory on the Snake River Plain, hosted at the U.S. Department of Energy's Idaho National Laboratory (INL). Your proposal to develop and test the technologies required to enable widespread adoption of Enhanced Geothermal Systems (EGS) will position Idaho, the region and the nation for sustained growth in a key baseload renewable power—geothermal energy.

It is great to see INL leading a diverse and well-respected proposal team, which includes industry representatives and the Idaho universities that work closely with the INL's Center for Advanced Energy Studies (CAES). A strong university and private-sector contribution to the research will have long-lasting positive impacts for Idaho, as will the education outreach activities you have planned. Your approach will keep Idaho in a position to lead technological advances in geothermal energy and ensure that geothermal power generation will have a stronger presence in the evolution of our renewable energy portfolio well beyond the 21st century.

I support the efforts of INL, CAES, and your collaborators as you seek to establish enhanced geothermal systems and look forward to helping your team in this important effort.

Sincerely,

Erv Grafwallner, Council Member  
City of Arco



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## City of Arco

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Gateway to the Craters of the  
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August 26, 2014

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

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I support the efforts of INL, CAES, and your collaborators as you seek to establish enhanced geothermal systems and look forward to helping your team in this important effort.

Sincerely,

Travis Gilchrist, Council Member  
City of Arco



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## City of Arco

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Fax (208) 527-8951



Gateway to the Craters of the  
Moon National Monument

August 26, 2014

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

Dear Dr. Podgorney,

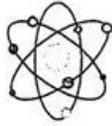
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Sincerely,

Virginia Parsons, City Clerk/Treasurer  
City of Arco



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## City of Arco

P.O. Box 196  
Arco, ID 83213  
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Fax (208) 527-8951



Gateway to the Craters of the  
Moon National Monument

August 26, 2014

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

Dear Dr. Podgorney,

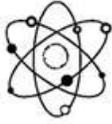
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Sincerely,

Tony Chisham, Maintenance Supervisor  
City of Arco



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## City of Arco

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Arco, ID 83213  
Phone (208) 527-8294  
Fax (208) 527-8951



Gateway to the Craters of the  
Moon National Monument

August 26, 2014

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

Dear Dr. Podgorney,

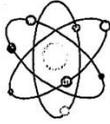
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I support the efforts of INL, CAES, and your collaborators as you seek to establish enhanced geothermal systems and look forward to helping your team in this important effort.

Sincerely,

Gene Davies, Council President  
City of Arco



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## City of Arco

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Phone (208) 527-8294  
Fax (208) 527-8951



Gateway to the Craters of the  
Moon National Monument

August 26, 2014

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

Dear Dr. Podgorney,

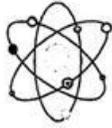
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I support the efforts of INL, CAES, and your collaborators as you seek to establish enhanced geothermal systems and look forward to helping your team in this important effort.

Sincerely,

Brett Holist, Maintenance  
City of Arco



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Fax (208) 527-8951



Gateway to the Craters of the  
Moon National Monument

August 26, 2014

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

Dear Dr. Podgorney,

It is my pleasure to support your proposal to initiate the establishment of the Department of Energy's proposed "Frontier Observatory for Geothermal Energy" (FORGE) Laboratory on the Snake River Plain, hosted at the U.S. Department of Energy's Idaho National Laboratory (INL). Your proposal to develop and test the technologies required to enable widespread adoption of Enhanced Geothermal Systems (EGS) will position Idaho, the region and the nation for sustained growth in a key baseload renewable power—geothermal energy.

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I support the efforts of INL, CAES, and your collaborators as you seek to establish enhanced geothermal systems and look forward to helping your team in this important effort.

Sincerely,

Kim Sanders, Maintenance  
City of Arco

## *The Bargain Barn*

"Customers and Employees First!"  
216 S Front Street, P.O. Box 116, Arco ID, 83213  
208-527-3402  
[TheBargainBarn@hotmail.com](mailto:TheBargainBarn@hotmail.com)

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

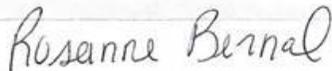
Dear Dr. Podgorney,

I was very excited to learn about your proposed project for geothermal energy in my area. I sincerely hope that your idea to start the Department of Energy's "Frontier Observatory for Geothermal Energy" Laboratory hosted at the Idaho National Laboratory gets the support that it deserves. I feel as though starting out the testing and new technologies related to Enhanced Geothermal Systems in Idaho will give our state and especially our rural area a distinct advantage to be on the cutting edge of this possible ground-breaking technology.

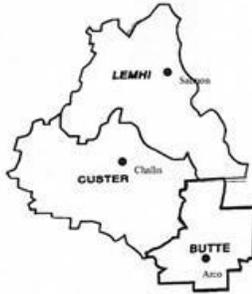
Because of the wonderful research performed at the INL our area has been the scene to many new and exciting technologies that have changed the world as we know it, and this is likely another opportunity to change the world. It is encouraging that you have built a strong team full of knowledgeable people to work on this project with you. It is also great to see that there are universities and private-sector contributions to your endeavor, which will undoubtedly create a long-lasting boost to our local economy. As I spoke to you about during your presentation, geothermal energy has always been an interest of mine, and it is extremely exciting to me to see that our area could possibly have the opportunity to participate in making some of the great possibilities that geothermal holds come true here. For our area to get to play a part in creating a real renewable energy technology is positively thrilling.

As a local business owner, and the Republican nominee for County Commissioner I can also clearly see the economic upside to your endeavor. Arco is the closest town to your project, and we would hope that we could work with you in any way possible way so that we can both prosper in this project. We will do all that we can to assist your team in this effort, and we look forward to working with you!

Sincerely,



Rosanne Bernal  
Owner, The Bargain Barn  
Business Incubation Center board member  
Lost River Economic Development board member  
Republican nominee for Butte County Commissioner  
Troop Boosters Chair



In Cooperation with the United States Department of Agriculture and Butte County  
159 North Idaho  
PO Box 832  
Arco, Idaho 83213  
Voice (208) 527-8587  
FAX (208)-527-3036  
Email [ccheyney@ag.uidaho.edu](mailto:ccheyney@ag.uidaho.edu)

September 7, 2014

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

Dear Dr. Podgorney,

It is a pleasure to support your proposal to initiate the establishment of the Department of Energy's proposed "Frontier Observatory for Geothermal Energy" (FORGE) Laboratory on the Snake River Plain, hosted at the U.S. Department of Energy's Idaho National Laboratory (INL). Your proposal to develop and test the technologies required to enable widespread adoption of Enhanced Geothermal Systems (EGS) will position Idaho, the region and the nation for sustained growth in a key baseload renewable power—geothermal energy.

It is great to see INL leading a diverse and well-respected proposal team, which includes industry representatives and the Idaho universities that work closely with the INL's Center for Advanced Energy Studies (CAES). A strong university and private-sector contribution to the research will have long-lasting positive impacts for Idaho, as will the education outreach activities you have planned. Your approach will keep Idaho in a position to lead technological advances in geothermal energy and ensure that geothermal power generation will have a stronger presence in the evolution of our renewable energy portfolio well beyond the 21st century.

I support the efforts of INL, CAES, and your collaborators as you seek to establish enhanced geothermal systems and look forward to helping your team in this important effort.

Sincerely,

A handwritten signature in blue ink that reads "Charles C. Cheyney". The signature is fluid and cursive, with a large initial "C".

Charles C. Cheyney  
Extension Professor / Extension Educator Butte County

To enrich education through diversity the University of Idaho is an equal opportunity/affirmative action employer and educational institution. University of Idaho and U.S. Department of Agriculture cooperating.



**BUTTE COUNTY CHAMBER OF COMMERCE**

"Promoting the Lost River Valleys"

P.O. BOX 837 — ARCO, IDAHO 83213

September 7, 2014

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

Dear Dr. Podgorney,

We at the Chamber support your proposal to initiate the establishment of the Department of Energy's proposed "Frontier Observatory for Geothermal Energy" (FORGE) Laboratory on the Snake River Plain, hosted at the U.S. Department of Energy's Idaho National Laboratory (INL). Your proposal to develop and test the technologies required to enable widespread adoption of Enhanced Geothermal Systems (EGS) will position Arco, Butte County, Idaho, the region and the nation for sustained growth in a key baseload renewable power—geothermal energy.

It is great to see INL leading a diverse and well-respected proposal team, which includes industry representatives and the Idaho universities that work closely with the INL's Center for Advanced Energy Studies (CAES). A strong university and private-sector contribution to the research will have long-lasting positive impacts for Idaho, as will the education outreach activities you have planned, including those for Butte County. Your approach will keep Idaho in a position to lead technological advances in geothermal energy and ensure that geothermal power generation will have a stronger presence in the evolution of our renewable energy portfolio well beyond the 21st century.

We support the efforts of INL, CAES, and your collaborators as you seek to establish enhanced geothermal systems and look forward to helping your team in this important effort. As representatives of local businesses, we are looking forward to working with the team as the project progresses.

Sincerely,

Melinda Shodin, Chair  
Butte County Chamber of Commerce



**Butte County School District #111**

250 S. Water St. – PO Box 89 – Arco, ID 83213 Phone (208) 527-8503 - Fax (208) 527-8950  
Spencer Larsen – Superintendent Lanell Farmer – Business Manager  
Julie Haney – Secretary  
[www.butteschooldistrict.org](http://www.butteschooldistrict.org)

August 27, 2014

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

Dear Dr. Podgorney,

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Having a dedicated and diverse team, which includes students from nearby universities, to work on this project will have a lasting impact in this region and our state. Knowing that you and other team members are willing to come into our local school district to discuss geothermal energy and other topics could greatly influence our students as they decide on career paths they might like to pursue.

I fully support all involved as you seek to establish enhanced geothermal systems.

Sincerely,

Spencer Larsen  
Superintendent  
Butte County School District

August 23, 2014

To: Dr. Robert Podgorney  
P.O. Box 1625  
2525 North Fremont Ave.  
Idaho Falls, Idaho  
83415

From: Clay Condit  
Idaho Science Center  
P.O. Box 27  
Arco, Idaho  
83213

Dear Sir:

Thank you for your presentation in Arco this week. It took me a while to assimilate its' significance, but with the help of your excellent handout, the one printed by CAES, I'm beginning to grasp its' potential.

In 2000 the Idaho Operations Office of the Department of Energy published an exceptional book entitled "*Proving the Principle*," written by Susan Stacey. That book chronicled years of INL's original, intense, research and development, and achievements, involving many aspects of nuclear energy, transpiring from 1949 to 1999. During that time the Laboratory successfully "*proved the principle*" that nuclear energy could be safely, widely, and economically used for many peaceful, and warlike, purposes.

With "*Enhanced Geothermal Systems*" it appears that INL may be once again embarking on a promising journey of "*proving the principle*," but this time seeking to prove that the vast, somewhat known, world-wide resource of geothermal energy can be mined to produce electrical energy, and perhaps unforeseen things, first locally at INL, then perhaps widely and economically. The sweep of technologies, old and new, and tools, old and new, which might be experimentally applied in that enterprise is breathtaking.

At our science center in Arco we often dazzle visitors with exhibits of unexpected and generally unknown major consequences of INL's (and others') past nuclear achievements, such as: *the "Mega-Peace," "from INL to the World," "Megatons to Megawatts, and "Ohio Class."* I look forward to doing the same with consequences of the "*Enhanced Geothermal Systems*" as it plays out.

Clay Condit,  
Phone: 208-527-3770



..

September 2, 2014, 2014

Dr. Robert K. Podgorney  
Idaho National Laboratory  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415



Via email to [robert.podgorney@inl.gov](mailto:robert.podgorney@inl.gov)

Re: Support for Selection of FORGE Lab at INL

The Idaho Clean Energy Association (ICEA) is a nonprofit organization dedicated to the advancement of renewable energy, energy efficiency and their associated technologies in the State of Idaho. The ICEA comprises businesses, organizations, and individuals from across the state that are focused on creating sustainable energy solutions in Idaho. We give a voice to Idaho's clean energy industry by uniting businesses, advocating for responsible policies, and developing public knowledge and awareness of energy issues. We endeavor to bring sustainability, efficiency, and independence to Idaho's energy economy.

We support the application of INL for the Department of Energy funding and creation of a field laboratory (called "FORGE"—Frontier Observatory for Research in Geothermal Energy) at the Idaho National Laboratory ("INL"). We realize that selecting the location for the FORGE laboratory is a competitive process but we feel Idaho is the best place because of the strong geothermal resources in the state, the long expertise of the INL in energy research and the potential further economic development of geothermal energy in Idaho. We support the INL's establishment of a Geothermal Resource Research Area on the western edge of the INL, where geologic conditions are most favorable.

We strongly value the INL's use of a broad technical team consisting of: INL, National Renewable Energy Laboratory (NREL), Center for Advanced Energy Studies (CAES, including University of Idaho and Idaho State University), University of Utah, University of Oklahoma, Mink GeoHydro, Baker Hughes, USGS, and the Idaho Geologic Survey. INL also shows its commitment to broad involvement by creating its "Advisory Panel" to help guide the efforts; it includes representatives from government, regulatory agencies, industry, environmental NGOs, community and others.

This proposal offers an outstanding research group and location. We strongly support INL's application and encourage DOE to award the FORGE funding and location to the INL-led group.

Sincerely,



Leif Elgethun, PE, LEED AP  
Chairman of the Board  
Idaho Clean Energy Association



A Division of the City of Idaho Falls

"A community with its own kind of energy"

September 9, 2014



Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Chief Scientist, Snake River Geothermal Consortium  
PO Box 1625 / MS 2025  
Idaho Falls, ID 83415

Dear Dr. Podgorney,

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I am particularly excited to see INL leading a diverse and well-respected proposal team, which includes industry representatives and the Idaho universities that work closely with the INL's Center for Advanced Energy Studies (CAES). A strong university and private-sector contribution to the research will have long-lasting positive impacts for Idaho, as will the education outreach activities you have planned. Your approach will keep Idaho in a position to lead technological advances in geothermal energy and ensure that geothermal power generation will have a stronger presence in the evolution of our renewable energy portfolio well beyond the 21st century.

I support the efforts of INL, CAES, and your collaborators as you seek to establish enhanced geothermal systems and look forward to helping your team in this important effort.

Sincerely,

A handwritten signature in black ink that reads 'Jackie Flowers'.

Jackie Flowers  
General Manager

PO Box 50220  
140 S Capital  
Idaho Falls ID 83405

Phone: 208-612-8438  
Fax: 208-612-8435  
[www.ifpower.org](http://www.ifpower.org)



## Attachment 2 INL-IDWR Monitoring Well Permitting Memo



December 22, 2009

CCN 219522

Mr. Dennis Dunn  
Idaho Department of Water Resources  
900 N. Skyline Drive  
Idaho Falls, ID 83402

**Subject:** Record of Meeting Concerning Well Permitting, Maintenance, and Decommissioning at the Idaho National Laboratory

**Reference:** Bennett, C. M., DOE-ID Letter to D. M. Dunn, IDWR, Record of Meeting Between Idaho Department of Water Resources, DOE-ID, and EG&G Idaho, Inc., 1993, OPEVES-93-098

Dear Mr. Dunn:

A meeting was held on November 3, 2009, between the Idaho Department of Water Resources (IDWR), U.S. Department of Energy Idaho Operations Office (DOE-ID), CH2M-WG Idaho LLC (CWI), and Battelle Energy Alliance, LLC (BEA). Those in attendance included Dennis Dunn (IDWR), Vanica Dugger (DOE-ID), Mike MacConnel (CWI), and Mike Lewis (BEA). The purpose of the meeting was to reaffirm the approaches used for meeting the requirements in the Well Construction Standards Rules (IDAPA 37.03.09) at the Idaho National Laboratory (INL) for constructing, maintaining, and decommissioning (abandoning) monitoring wells, drinking/production water wells, deep injection wells, and geotechnical boreholes. The intent is to ensure that the IDWR receives the required fees, data and information it needs and to also provide INL formal guidance to ensure those needs are met.

The following approaches were agreed to by all parties in attendance. These are similar with the original approaches concerning licensed well drillers, permits, and permit fees agreed to by IDWR, DOE-ID, and EG&G and documented in the referenced 1993 letter from DOE-ID to IDWR.

### **Permitting:**

**Requirement** - Drilling permits are required pursuant to Section 42-235, Idaho Code, prior to construction or modification of any well (IDAPA 37.03.09.045.01.a).

**Approach** - An annual drilling permit application will continue to be submitted to the IDWR in January of each year. The application will include INL Site monitoring wells proposed for construction during the current calendar year and any monitoring wells constructed during the previous calendar year that were not covered in a previous application. In addition, the application may include deep injection wells and remediation wells. Individual permits will not be issued for these wells.

Individual applications will be submitted for drinking/production water wells and a drilling permit will be issued.

**Requirement** - The application for a permit for all monitoring wells and remediation wells must include a design proposal prepared by a licensed engineer or registered geologist pursuant to Section 42-235, Idaho Code (IDAPA 37.03.09.025.13).

P.O. Box 1625 • 2525 North Fremont Ave. • Idaho Falls, Idaho 83415 • 208-526-0111 • [www.inl.gov](http://www.inl.gov)  
Battelle Energy Alliance, LLC

Mr. Dennis Dunn  
December 22, 2009  
CCN 219522  
Page 2

**Approach** – Instead of submitting a design proposal, a construction diagram and information for each completed monitoring or remediation well will be submitted to the IDWR in the annual *Water Use Report and Comprehensive Well Inventory* in June of each year.

**Permit Fees:**

**Requirement** – Drilling permit fees are as prescribed in Section 42-235, Idaho Code (IDAPA 37.03.09.045.05a). There shall be a \$75 charge for the well permit if the well is to be used for domestic or monitoring purposes. If the well is to be used for other than domestic or monitoring purposes, the charge for the permit shall be \$200. A blanket permit shall be \$100 plus an additional \$50 per well.

**Approach** - For monitoring wells, INL pays the \$75 well permit fee or a blanket permit fee of \$100 plus \$50 for each non-Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) well. Well permit fees are not required for wells drilled for CERCLA purposes. The applicable permit fees are submitted in the annual drilling permit application.

A \$200 well permit fee is submitted for each deep injection or remediation well and is submitted in the annual drilling permit application.

The \$200 well permit fee for drinking/production wells is submitted with the individual well permit application.

**Licensed Well Driller:**

**Requirement** - Section 42-238 states that a well driller's license must be obtained for anyone to drill and/or modify a well.

**Approach** - For drilling or modification of all monitoring, remediation, deep injection, and drinking water/production wells, a licensed driller will be used. A licensed well driller is not used for geotechnical boreholes even though water may be encountered.

**Completion of a Well:**

**Requirement** - Well driller must permanently affix the stainless steel well tag to the steel surface casing in a manner and location that maintains tag legibility (IDAPA 37.03.09.025.17.b).

**Approach** - IDWR does not issue well tags for INL wells. The INL is responsible for identifying each well. This is done several ways: 1. Name of well stamped in brass cap; 2. Name of well and well ID fixed to well box.

**Well Maintenance:**

**Requirement** - Maintain the well to prevent waste or contamination of ground waters through leaky casings, pipes, fittings, valves, pumps, seals or through leakage around the outside of the casings, whether the leakage is above or below the land surface. Any person owning or controlling a non-compliant well must have the well repaired by a licensed well driller under a permit issued by the Director in accordance with these Rules (37.03.09.036.02.e).

Mr. Dennis Dunn  
December 22, 2009  
CCN 219522  
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**Approach** - Well maintenance will be performed under the supervision of a professional engineer or geologist.

**Well Decommissioning:**

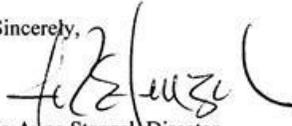
**Requirement** - The well owner is charged with maintaining and properly decommissioning (abandoning) a well in a manner that will prevent waste or contamination, or both, of the ground water. No person is allowed to decommission a well in Idaho without first obtaining a driller's license or receiving a waiver of the license requirement from the Director of the Department of Water Resources. Authorization is required from the Director prior to decommissioning any well. Upon decommissioning, the person who decommissioned the well must submit to the Director a report describing the procedure (IDAPA 37.03.09.025.16.a).

**Approach** - Approval is obtained prior to decommissioning all drinking water/production and injection wells.

For all other wells, a letter is submitted to the IDWR identifying wells that are proposed for decommissioning. Formal approval is not issued by the IDWR for decommissioning these wells. The wells are then abandoned under the supervision of a professional engineer or geologist. Information describing the method used for abandonment is then submitted to the IDWR in the annual *Water Use Report and Comprehensive Well Inventory* in June of each year.

If you have any questions regarding this information, please contact Mike Lewis at (208) 526-0623.

Sincerely,



Jo Anna Stenzel, Director  
Environmental Support and Services

MGL:AT

cc: J. Alvarez, INL, MS 3695  
R. Y. Bowser, CWI, MS 3960  
K. M. Downer, INL, MS 3405  
V. Dugger, DOE-ID, MS 1216  
J. J. Grossenbacher, INL, MS 3695  
D. P. Hutchison, CWI, MS 5108  
W. L. Jolley, CWI, MS 3940  
R. M. Kauffman, DOE-ID, MS 1216

D. C. Long, DOE-ID, MS 1240  
M. J. MacConnel, CWI, MS 5108  
M. D. O'Hagan, DOE-ID, MS 1209  
S. M. Olson, DOE-ID, MS 1240  
T. L. Perkins, DOE-ID, MS 1216  
J. Saye, CWI, MS 2506  
L. A. Sehlke, INL, MS 3810  
F. L. Webber, CWI, MS 3920



## Attachment 3 Mineral Rights Memorandum of Understanding between DOE-ID and BLM



**Department of Energy**

Idaho Operations Office  
1955 Fremont Avenue  
Idaho Falls, ID 83415

December 12, 2011

Mr. Jeremy Casterson, Field Manager  
Bureau of Land Management  
Idaho Falls District Office  
Upper Snake Field Office  
1405 Hollipark, Drive  
Idaho Falls, Idaho 83401-2196

SUBJECT: Memorandum of Understanding between the Department of Energy, Idaho Operations Office and the Bureau of Land Management (IS-11-062)

Dear Mr. Casterson:

Enclosed for your records and use is the latest signed copy of the Memorandum of Understanding (MOU) between our organizations. Please use the attached exhibits as appropriate for rights-of-way and grazing operations on the INL.

If you have any questions on the enclosed MOU or exhibits, please feel free to call me at (208) 526-9322, or Dan Shirley of my staff at (208) 526-9905.

Sincerely,

A handwritten signature in black ink that reads "W F Hamel".

William F. Hamel, Assistant Manager  
Infrastructure Support

Enclosure

MOU NO. ID11451

MEMORANDUM OF UNDERSTANDING  
BETWEEN  
DEPARTMENT OF ENERGY, IDAHO  
OPERATIONS OFFICE  
AND  
BUREAU OF LAND MANAGEMENT

I. PURPOSE AND SCOPE

This Memorandum of Understanding (MOU) is between the Department of Interior, Bureau of Land Management (BLM) Idaho Falls District, Upper Snake Field Office and the United States Department of Energy, acting through its Idaho Operations Office (DOE-ID). It provides for the cooperative management of certain land within the Idaho National Laboratory Site (INL).

Except where noted, this MOU supersedes all other agreements between the Parties. It does not change requirements imposed on the Parties by law or the INL Public Land Orders (PLOs).

II. AUTHORITY

BLM. Sections 302 and 307 of the Federal Land Policy and Management Act of 1976 (FLPMA), 43 U.S.C. § 1732 and § 1737, as amended, authorize BLM to enter into cooperative agreements with other agencies to manage, protect, and develop public lands. Additional authority includes the Timber Protection Act, 16 U.S.C. § 594; 42 U.S.C. §§ 1856, et seq. covering reciprocal fire protection agreements; and the Federal Fire Prevention and Control Act of 1974, 15 U.S.C. § 2201.

DOE-ID. Section 161(g) and Section 161(q) of the Atomic Energy Act, 42 U.S.C. §§ 2201(g) and (q), authorizes the Atomic Energy Commission (now the Department of Energy through other enabling legislation) to acquire, use, and dispose of real property. Several other laws provide authority for DOE-ID to use real property to meet mission requirements.

III. RESPONSIBILITIES.

A. GRAZING

BLM Upper Snake Field Office will administer grazing on areas within the INL open to grazing. The following procedures will be followed:

- BLM will issue grazing permits and provide to the current DOE-ID liaison a copy of each permit and any modification to the permit, as well as a yearly permittee turnout schedule and permittee contact information upon request. BLM will include a copy of the Stipulations contained in Exhibit A with each grazing permit.

- The Parties will work together to establish reasonable security and safety controls for the protection of grazing operators in the event of an emergency. These controls will include protocols for notifying grazing operators of an emergency.
- BLM will provide grazing use supervision as required by Federal Land Policy Management Act (FLPMA).
- With advance notice to BLM and the affected operator(s), DOE-ID may revise the areas open to grazing if grazing conflicts with DOE-ID missions or security requirements.
- DOE-ID will notify BLM and the affected operator(s) if a temporary interruption to grazing is required. Notification will specify the area involved and when the interruption will begin and end. BLM with DOE-ID's assistance will work with the affected operators to identify alternate areas that may be grazed during the interruption.
- DOE-ID and BLM will work together to manage INL land consistent with applicable requirements and the Conservation Plan for the Greater Sage-Grouse in Idaho for the purpose of conserving sage-grouse and sage-grouse habitat.
- DOE-ID will provide a letter annually to BLM that includes an updated map of active leks buffered by 1 km distances. DOE-ID will request that BLM send the letter to permittees as applicable, with an offer that ESER biologists would be willing to accompany operators/herders into the field to help them identify lek locations.

#### B. PREDATOR CONTROL

Both parties agree that predator control on INL land withdrawn under PLOs may be conducted by the United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services using the same regulations, guidelines, and criteria applicable to other non-INL public lands. The parties will establish protocols that address predator control involving land owned by DOE-ID in security requirements, duration, advance notifications and use of aircraft, weapons and poisons.

#### C. RANGE IMPROVEMENTS

BLM Upper Snake Field Office may, at any time, propose rangeland improvements to INL land or vegetation. These proposals will be referred to DOE-ID for review and a final determination. Proposals will be approved unless they conflict with DOE-ID missions, ecosystem management goals, and security requirements, or DOE-ID's Comprehensive Facility and Land Use Plan. BLM or the authorized operator will be responsible for making the improvements.

#### D. NOXIOUS WEEDS OR INSECT INFESTATIONS

The Parties will cooperate among themselves and with other interested agencies in controlling noxious weeds and insects on INL land or on land adjacent to the INL.

BLM will have the lead responsibility for noxious weed management within the grazing areas on the INL, including monitoring of conditions within those areas.

E. UPPER SNAKE RIVER ECOSYSTEM

INL contains approximately 890 square miles of the Upper Snake River Ecosystem. This area has been designated as a National Environmental Research Park. The Parties will share scientific and monitoring information on natural and cultural resources; work toward data compatibility (GIS); and where feasible, coordinate and consolidate management activities. DOE-ID and BLM will seek out management opportunities where both agencies' interests are met in a consolidated, coordinated cost-effective fashion. In 1999, DOE, BLM, the U.S. Fish and Wildlife Service, and the Idaho Department of Fish and Game signed an MOU designating approximately 73,000 acres of the INL Site as the Sagebrush Steppe Ecosystem Reserve (Reserve). That MOU requires the agencies to jointly develop a management plan for the Reserve providing for retention of its unique resources and establishing a platform for ecosystem research and interagency cooperation.

F. RIGHTS-OF-WAY

Right-of-way applications may be submitted to either BLM or DOE-ID. Copies of applications made to one Party (as well as copies of any written communications relating to the applications) will be forwarded to the other Party within ten (10) working days of receipt.

DOE-ID will act as lead agency in the following instances:

1. When processing applications made in direct support of DOE-ID missions, even where the Right-of-Way involves land subject to a PLO.
2. When an application submitted to BLM will be denied because of DOE-ID security or mission requirements.
3. When an application corresponds to a location on DOE-owned land.

BLM will act as lead agency on all other applications.

The lead agency is responsible for complying with all environmental, cultural, and archeological requirements. The lead agency is also responsible for consulting with Native American Tribal Governments and other stakeholders affected by the application.

The Parties will process each application under one of the two following processes. Exhibit B is the process that will be followed where DOE-ID is the lead agency. Exhibit C is the process that will be followed where BLM is the lead agency. Both Exhibit B and Exhibit C may be changed at any time by mutual agreement of the Parties without having to process a formal change to this MOU.

DOE-ID may work with BLM to establish corridors or land areas within the INL that are acceptable for utility Rights-of-Way. If such corridors or land areas are established, their boundaries may be changed at any time by DOE-ID without having to process a formal change to this MOU.

If the Right-of-Way application is approved, BLM will note the right-of-way to the Public Land Records maintained by BLM for the United States Government and collect processing, monitoring and rental fees.

The Stipulations in Exhibit D must be included in any Right-of-Way granted by either BLM or DOE-ID. The Stipulations may be revised at any time by DOE-ID without having to process a formal change to this MOU.

**G. MINERAL EXPLORATION AND MINERAL MATERIAL DISPOSAL**

Mining claim location and mineral leasing are not allowed on the INL.

Mineral material disposal under 30 U.S.C. §601, et seq. is the responsibility of BLM. It is allowed on that portion of the INL covered by PLO 1770, unless it conflicts with DOE-ID missions, ecosystem management goals, or security requirements. BLM will give DOE-ID a copy of each material disposal application received for the INL. If DOE-ID approves the disposal, BLM will be provided with any additional requirements to be included in the disposal authorization. BLM will prepare any environmental documents for the material disposal, will enforce Conditions of Approval of the mineral material authorization, and is responsible for mine safety administration/enforcement. BLM will also collect all fees from the applicant for mineral material disposal.

BLM will provide a copy of the approved application and the environmental documentation to DOE-ID. If DOE-ID disapproves of the disposal, BLM will be provided the reasons for its disapproval. Formal denial of the application will be made by BLM.

**H. FIRE SUPPRESSION/MANAGEMENT AND OTHER EMERGENCIES**

The Parties will continue entering into annual Mutual Aid Agreements. These Mutual Aid Agreements allow for timely, coordinated, and efficient use of dispatch and other personnel during wild land fires and other emergencies. They also permit the exchange of personnel between the East Idaho Interagency Fire Center and the INL Communications Center, and provide opportunities for cross training to take advantage of specific agency resources. Each annual Mutual Aid Agreement and associated fire suppression Annual Operating Plan must be approved by not later than June 1.

The Parties will work together to address any other emergencies on or near the INL.

**I. COLLABORATIVE RESOURCE MANAGEMENT**

The Parties will work together to identify opportunities that will help further their missions and needs. The INL has a large capability in science, engineering and environmental remediation capabilities. BLM has large land holdings that provide opportunities and challenges to the science and engineering disciplines. On a continuing basis, the Parties will look for opportunities to improve efficiencies and solve common problems.

**J. GENERAL AGREEMENT ON THIRD PARTY USE OF LAND WITHIN THE INL**

The Parties will explore making INL land available for multiple uses where consistent with DOE-ID's mission, ecosystem management goals, land use planning requirements, security concerns, and restrictions imposed by law or other agreement.

Except as otherwise agreed by the Parties, BLM will not take any action granting third party

use of land within the INL without prior written approval of DOE-ID.

IV. MISCELLANEOUS

- A. This MOU does not obligate appropriated funds nor obligate either Party to spend appropriated funds. Each Party will conduct its activities under this MOU using its own appropriated funds, and is solely responsible for all liabilities resulting from its (or its contractors) acts, omissions, or violation of law.
- B. Each Party will (1) provide to the other a written list of contacts by subject area no later than 30 days after the effective date of this MOU; (2) notify the other Party, in writing, when a change has been made to the contacts list; and (3) use this contacts list when requesting or providing information or assistance.
- C. The Parties will meet prior to June 1 of each year to discuss mutual concerns and the annual fire suppression plan described in III. H. above.
- D. This MOU may be changed at any time by a written amendment signed by both Parties.
- E. Either Party may terminate this MOU by providing 30 days advance written notice to the other Party.
- F. This MOU is effective for five (5) years after both Parties sign it. No later than 90 days before it expires, the Parties will decide whether it should be extended and revised. Extensions and revisions must be in writing and signed by both Parties.

U.S. DEPARTMENT OF ENERGY  
IDAHO OPERATIONS OFFICE

BUREAU OF LAND MANAGEMENT  
IDAHO FALLS DISTRICT  
UPPER SNAKE FIELD OFFICE

By: W.F. Hamel 10/24/2011  
William F. Hamel  
Assistant Manager  
Office of Infrastructure Support  
Department of Energy  
Idaho Operations Office

By: Jeremy Casterson 10/24/11  
Jeremy Casterson  
Field Manager  
Upper Snake Field Office

EXHIBIT A

STIPULATIONS FOR GRAZING ON LAND WITHIN

THE IDAHO NATIONAL LABORATORY (INL)

1. Ranchers and stockmen (Permittees) authorized on BLM grazing allotments within or adjacent to the Idaho National Laboratory Site (INL) may request and be given access onto the INL for the purposes of traversing the INL. However, the Permittee and his/her employees and agents must have in their possession a Local Site Specific Only (LSSO) Rancher badge. These badges are a non-picture, name only badge that are white in color (U.S. Citizens) or red in color (non-U.S. Citizens) and have a steer emblem in the background and are issued only to those Permittees and their employees and agents who are authorized on BLM grazing allotments and is valid for one year.
2. Permittees having grazing privileges within or immediately adjacent to the INL boundaries may access and traverse the INL, using the most direct route for the purposes of caring for their animals and checking on their employees (herders, riders, etc.). However, they must remain on the prescribed route while within the confines of the INL.
3. The following conditions apply regarding accessing the INL:
  - a) All Permittees will receive and read a US Department of Energy Idaho Operations Office (DOE-ID) Idaho Cleanup Project Safety Brochure on Military Munitions on the INL. They will also ensure that all their employees and agents working on the INL receive and read the brochure.
  - b) The driver and passengers (if any) within the vehicle, regardless of the access point must present their Rancher Badge, which is a Laboratory Site Specific Only (LSSO) badge and a picture identification (e.g. drivers license) to Security Police Officer (SPO) manning the access gate.
  - c) Permittees are not authorized to escort anyone onto or within the boundaries of the INL. All persons accompanying the Permittees must be badged.
  - d) Permittees are authorized to access the INL using existing access gates and use existing T-roads and two-track roads from the INL major roads to access their livestock when they are grazing within their permitted allotment area(s) both on or adjacent to the INL. Vehicular travel off existing roads or two tracks is not allowed.
  - e) The SPO shall remind Permittees while accessing the INL through Gates 1, 3 or 4, that they must use the most direct route possible when traversing the INL (e.g. Lincoln Boulevard, East Portland, etc. Permittees must always remain on prescribed roadways while within the confines except when using an existing T-road or two-track road to access their livestock. Permittees must exit through one of the approved access gates (i.e. Gate 1, 3, or 4) when traversing the INL.
  - f) Permittees are prohibited to have in their possession any prohibited items as prescribed in the SPO's post and patrol orders (e.g. firearms, ammunition,

explosives/incendiary devices, illegal drugs, alcoholic beverages, etc.), with the exception of their working dogs, which must stay in the vehicle when not actually working livestock.

- g) Permittees must follow all INL security regulations and procedures imposed on their activities. Prior to commencement of any activity that involves access to the INL Site, Permittees must obtain INL identification badges for their employees and agents and instruction on security regulations and procedures. Point of contact for these requirements is the Central Facilities Area Physical Security Officer (telephone (208) 526-0577).
- 4. Permittees are prohibited from removing or destroying any archeological site or artifact on the INL, including Native American human remains, funerary artifacts, ceremonial or religious artifacts, cultural artifacts, or camp sites or structures. Anything discovered must be left in place. Permittees are reminded that destruction or removal of such Native American items is illegal and may subject Permittees to criminal penalties.
- 5. All wastes, including hazardous substances spills, generated by the Permittee from grazing on the INL must be remediated as appropriate and disposed of off-site.
- 6. During the sage-grouse lekking season (March 15 through May 15), sheep grazing and associated herding activities are restricted within 1 km of active leks or direct line of sight, whichever is less. Trailing activities in those areas will still be allowed.
- 7. Where possible, mineral supplements and water troughs shall be placed in previously disturbed areas.
- 8. The INL, DOE-ID and DOE-ID contractors are not financially responsible for any costs or any damages (consequential or otherwise) related to Permittee's operations or compliance with these Stipulations.

#### EXHIBIT B

##### RIGHT-OF-WAY PROCESS WHEN DOE-ID IS THE LEAD AGENCY

- 1. An applicant will file SF 299 "Application for Transportation and Utility Systems and Facilities on Federal Lands" (Application) with either BLM or DOE-ID. If BLM receives the Application, BLM will send a copy to DOE-ID within 10 days of receipt. If DOE-ID receives the Application, DOE-ID will send a copy to BLM within 10 days of receipt.
- 2. BLM will promptly give DOE-ID a BLM case file number specific to the request and send notice of the case file number to the Applicant.
- 3. The DOE-ID Land Use Planning Committee (Committee) will review the Application. If the Committee believes DOE-ID should process the Application, DOE-ID will notify BLM of that decision. DOE-ID will act as lead agency in addressing all legal (e.g., NEPA, Cultural) and Intergovernmental (e.g., American Indian Tribal Government) requirements.
- 4. DOE-ID will ask each affected DOE-ID office (e.g. NEPA, Cultural, Tribal, etc.) to review the Application and determine what must be submitted to DOE-ID by the Applicant for

review.

5. DOE-ID will send a letter to the Applicant (copying BLM on the letter) that:
  - a. Acknowledges receipt of the Application;
  - b. Notifies the Applicant he/she/they will receive a separate letter from BLM containing a BLM case file number specific to the request and describing BLM's "Right-of-Way Cost Recovery Category Fee Determination;"
  - c. Identifies what information each DOE-ID office requires from the Applicant to further its Application, and a name and telephone number of each office point of contact. The Applicant will acquire and submit this information at its own expense; and
  - d. Includes a current copy of the "DOE-ID Right-of-Way Stipulations" (Stipulations) that the Applicant must honor if it is granted the right-of-way.
6. Once the Applicant has submitted all requested information, DOE-ID will review the entire application package and either approve or deny the Application.
  - a. If DOE-ID approves the Application, it will notify the Applicant and forward a complete copy of the Application package to BLM.
    - (1) BLM will forward to the Applicant a copy of its "Right-of-Way Grant Offer" with pertinent BLM and DOE-ID Stipulations.
    - (2) The Applicant will sign and return a "Right-of-Way Grant Offer" (Grant) to BLM, and pay all fees and costs. BLM will send DOE-ID a copy of the signed Right-of-Way.
    - (3) BLM will note the right-of-way to the Public Land Records maintained by BLM for the U.S. Government.
7. If DOE-ID denies the Application, it will notify the Applicant, and forward a complete copy of the Application package and the denial to BLM.

#### EXHIBIT C

##### RIGHT-OF-WAY PROCESS WHEN BLM IS THE LEAD AGENCY

1. An applicant will file SF 299 "Application for Transportation and Utility Systems and Facilities on Federal Land" (Application) with either BLM or DOE-ID. If BLM receives the Application, BLM will send a copy to DOE-ID within 10 days of receipt. If DOE-ID receives the Application, DOE-ID will send a copy to BLM within 10 days of receipt.
2. BLM will promptly give DOE-ID a BLM case file number specific to the request and send notice of the case file number to the Applicant.
3. The DOE-ID Land Use Planning Committee (Committee) will review the Application. If the Committee believes the right-of-way should be granted, but BLM should process the Application, DOE-ID will notify BLM that it may process the Application.
4. DOE-ID will not be further involved in the process except as requested by BLM and to forward a current copy of the "DOE-ID Right-of-Way Stipulations" (Stipulations).
5. BLM will work with the Applicant to process the Application through to completion. BLM

will act as lead agency in addressing all legal (e.g., NEPA, Cultural Resources) and Intergovernmental (e.g., American Indian Tribal Government) requirements.

6. Once the ROW has been fully processed by BLM but before it is granted, DOE-ID will be given one final review of the Application package for mission and security impacts only.
  - a. If there are additional impacts, those will be resolved with BLM and addressed in revised Stipulations.
  - b. If additional impacts cannot be resolved by revised Stipulations, DOE-ID will notify BLM it will assume lead agency status for purpose of denying the Application.
7. BLM will send to DOE-ID a copy of the signed ROW once it is granted.

EXHIBIT D

DOE-ID RIGHT-OF-WAY STIPULATIONS

**Specific Obligations of the Grantee**

Grantee, its contractors, agents, and employees (Grantee) must **at its sole expense** comply with all of the following requirements while using lands within the Idaho National Laboratory (INL) Site:

1. Grantee must follow all INL security regulations and procedures imposed on its activities. Prior to commencement of any activity that involves access to the INL Site, Grantee must obtain INL identification badges for its employees and agents and instruction on security regulations and procedures. Point of contact for these requirements is the Central Facilities Area Physical Security Officer [telephone (208) 526-0577].
2. Grantee must obtain all permits, licenses, and authorizations necessary for it to conduct activities under this Right-of-Way and must abide by all federal, state, and local requirements that apply to its activities under this Right-of-Way.
3. Grantee will receive and read a US Department of Energy Idaho Operations Office (DOE-ID) Idaho Cleanup Project Safety Brochure on Military Munitions on the INL. Grantees must also ensure that their employees and agents working on the INL receive and read the brochure.
4. Grantee may excavate only where necessary and only within the area included within this Right-of-Way. If Grantee will excavate in an area that has not been previously disturbed, a cultural resources survey must be performed and clearance given by the Department of Energy, Idaho Operations Office (DOE-ID) before excavating. If Grantee will excavate in an area designated as an institutionally controlled unexploded ordnance area that has not been previously cleared, an unexploded ordnance survey must be performed and clearance given by DOE-ID before excavating.
5. Grantee must use existing roads. Any necessary travel off existing roads is allowed only with advance permission from DOE-ID.
6. Grantee must immediately notify DOE-ID if it finds any archeological site, including Native American human remains, funerary artifacts, ceremonial or religious artifacts, cultural artifacts, or camp sites or structures. Grantee must immediately stop any work that may disturb or destroy an archeological site. Anything discovered must be left in place. Grantee is prohibited from releasing to the public any information pertaining to the location of archeological sites.
7. Grantee must immediately notify the Central Facilities Area Physical Security Officer [telephone (208) 526-0577] if it finds any unexploded ordnance. Grantee must immediately stop any work that may disturb the identified unexploded ordnance.

8. Not later than thirty (30) days after written notice from DOE-ID, Grantee must modify any structures or equipment located on the INL or modify any operation or activity furthering the purpose(s) for which this Right-of-Way is granted where either has or potentially has an adverse impact on (a) an INL mission; (b) INL security requirements; or (c) INL environmental, safety or health (ES&H) requirements. If the impact cannot be eliminated, this Right-of-Way is automatically terminated.
9. Grantee must not damage any existing or future Government-owned facilities or equipment. Grantee must promptly repair or replace any Government-owned facilities or property damaged or destroyed as a result of Grantee's activities, including survey monuments.
10. Grantee must maintain its facilities and equipment located within this Right-of-Way so that they do not present a hazard to people or the environment.
11. Grantee must comply with reasonable requirements imposed as conservation measures for the protection of wildlife within the INL, including, but not limited to the requirement to (a) bury utility lines in important habitat areas; (b) limit the construction of utility lines, guy wires and fences in important habitat areas (and if their construction is absolutely necessary, mark them to minimize collisions with sage grouse, raptors and other protected species) and seasonal use restrictions for sage-grouse breeding activities.
12. Grantee is responsible for establishing limiting conditions and mitigation activities for the area within this Right-of-Way consistent with other measures across the INL. This responsibility includes keeping the area free from accumulations of rubbish, debris, and weeds or other non-indigenous plants. DOE-ID's Environmental Surveillance, Education and Research contractor, currently Gonzales-Stoller Surveillance, LLC, may be contacted for further guidance on mitigation activities, weeds and non-indigenous plants.
13. Grantee must pay all Federal, state, and local taxes and fees associated with its activities and operations.
14. Grantee must not assign any interest in the Right-of-Way without advance written permission from DOE-ID.
13. Grantee must use the Right-of-Way only for the purposes described in the Right-of-Way. Any change in use or scope of the activities identified, including a change of spectrum use, must receive prior DOE-ID approval.
14. Grantee must disclose any significant use of the electromagnetic frequency spectrum, if any, associated with its activities under this Right-of-Way with its application. Failure to disclose use of the spectrum may, at DOE's discretion result in termination of the Right-of-Way. Further, Grantee must receive prior approval from DOE for any significant changes to the electromagnetic spectrum.
15. All wastes, including hazardous substances spills, generated by the Grantee from construction on and use of the area included within this Right-of-Way must be remediated as appropriate and disposed of off-site.
16. Grantee must remove all facilities and equipment and restore the site to its pre-Right-of-Way condition no later than 120 days after it permanently stops activities under this Right-of-Way. Lands disturbed by the Grantee's activities and final restoration of the site includes an

obligation to re-establish native vegetation (native seeds or seedlings) for those areas disturbed by Grantee operations. Grantee must obtain a list of appropriate native species from DOE-ID's Environmental Surveillance, Education, and Research contractor, currently Gonzales-Stoller Surveillance, LLC.

17. Grantee must contact the Central Facilities Area Physical Security Office [telephone (208) 526-0577] if an employee or agent who has not already been cleared by INL security needs immediate access to the Right-of-Way site.

**Other Conditions and Requirements**

1. DOE-ID reserves the right to construct roads, drill wells, and perform other activities in the area included within this Right-of-Way. DOE-ID will take reasonable steps to avoid affecting Grantee's operations.
2. DOE-ID and Tribal representatives may view and inspect any archeological site discovered within the Right-of-Way.
3. This Right-of-Way is not exclusive. DOE-ID may grant additional rights to use the area within the boundaries of this Right-of-Way.
4. Grantee will indemnify and hold harmless the United States and any person or entity acting on behalf of the United States from: (a) all costs, damages, fines, or penalties; and (b) all costs of defending any action that involves Grantee activities under this Right-of-Way.
5. This Right-of-Way may be terminated at the sole discretion of DOE-ID if (a) reasonably necessary for DOE-ID to fulfill its statutory missions; (b) Grantee fails to comply fully and promptly with any requirement contained in this document or in this Right-of-Way, or (c) this Right-of-Way has been abandoned by Grantee.
6. The INL, DOE-ID and DOE-ID contractors are not financially responsible for any costs or any damages (consequential or otherwise) related to Grantee's operations or compliance with these Stipulations.



## Attachment 4 Groundwater Impacts Flyer

### An Enhanced Geothermal System Field Laboratory on INL—Water Quality and Use

The Eastern Snake River Plain (ESRP) is a structural depression approximately 30-70 miles wide and 200 miles long, encompassing approximately 11,000 square miles of southeastern Idaho. It is the result of the passage of southern Idaho over the Yellowstone Hotspot over the last 15 million years. The volcanic activity left a very large amount of heat in the Idaho subsurface, creating regional heat flows among the highest on earth. With proper enhancements of the deep reservoir rocks, the immense amount of thermal energy stored deep beneath the ESRP has the potential to become a world-class resource of geothermal energy. Idaho National Laboratory (INL) is leading an effort to evaluate and test the best methodologies to extract this thermal energy and make it available for electrical energy generation.

The Eastern Snake River Plain Aquifer (ESRPA) lies above the hot volcanic rock and is one of the largest and most productive aquifers in the United States. Recharge to the aquifer primarily comes from snowfall in the highlands bordering the Plain and from infiltration of water from irrigation, canals, rivers and reservoirs. Groundwater flows southwesterly beneath the plain and is discharged to the Snake River in the Thousand Springs Area near Hagerman, Idaho, approximately 130 miles southwest of INL. Water in the aquifer is cold (<55 °F) and is primarily contained in highly permeable basalt flows. The quality of the water is exceptional and is generally characterized as Ca-Mg-CO<sub>3</sub> water, which is typical of western aquifers (see Table 1).

To test engineering methods for extracting heat from the deep volcanic rocks with low permeability, INL is leading an effort to construct an experimental Enhanced Geothermal System (EGS) field laboratory near the western edge of the INL. Unlike conventional geothermal systems where hot water exists in a reservoir with high permeability, the next generation of geothermal power plants will rely on reservoirs that have been engineered so that the native permeability is enhanced. The hot deep rocks are “tight”; meaning they don’t transmit water easily. The small amount of water present is contained in very small pore spaces. Water samples from deep ESRP wells (Sturm well and INEL-1, see Table 1) indicate that the existing water in the deep formations is good quality Na-HCO<sub>3</sub> type water; having low total dissolved solids (TDS) and low concentrations of major and trace elements.

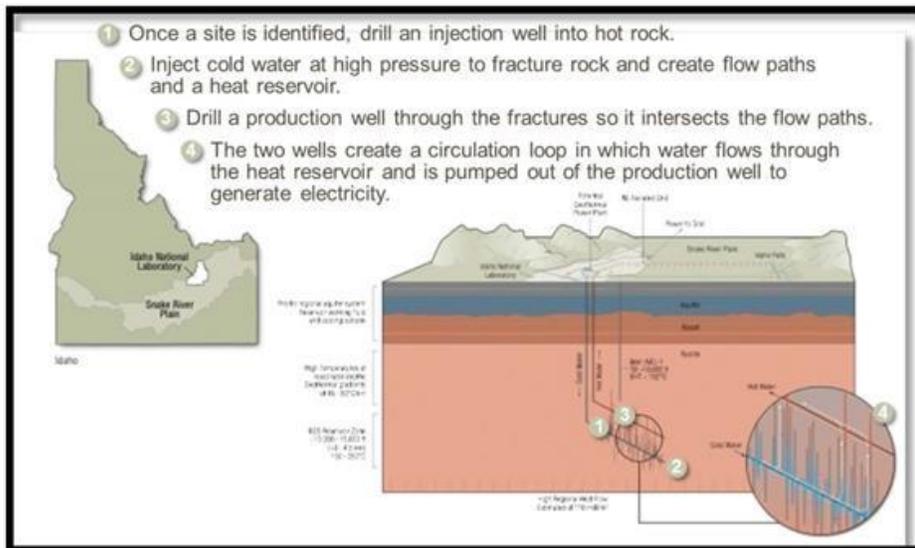
The EGS laboratory will extract heat from thousands of feet below the aquifer through carefully sealed wells, built to ensure no water moves from the deeper zones to the aquifer or vice-versa. Wells will be drilled through the sediments and volcanic rock hosting the ESRPA to the underlying hot rocks at depths greater than 8,000 feet, where temperatures are expected to reach 250-400 °F. Once at depth, a special steerable drill bit will be used to deviate from vertical to a more horizontal orientation (see Fig. 1). The first well (i.e. the lower well) will be used to create zones with high permeability. Afterwards, the second well (i.e. the production well) will be drilled into the rock above the first well, intersecting the newly created permeability zone and creating a hydraulic connection between the two wells. Initially, heat will be extracted from the deep rocks by pumping cold ESRPA water from INL’s existing groundwater right into the lower well, allowing the water to heat up, and then pumping the hot water to the surface in the upper well. Once the hot water is allowed to cool at the surface, it will be recycled by reinjecting it in the lower well. Very little water will be lost to the system in this mostly non-consumptive use of water. No wastewater will be produced or created. Estimated water usage for the initial reservoir creation and

testing is on the order of 1,000 gallons per minute (gpm) for a period of several weeks. Long term, it is expected that less than 100 gpm of ESRPA water will be used once the “recycling” begins. This estimate accounts for losses that may occur through the deep system or evaporation.

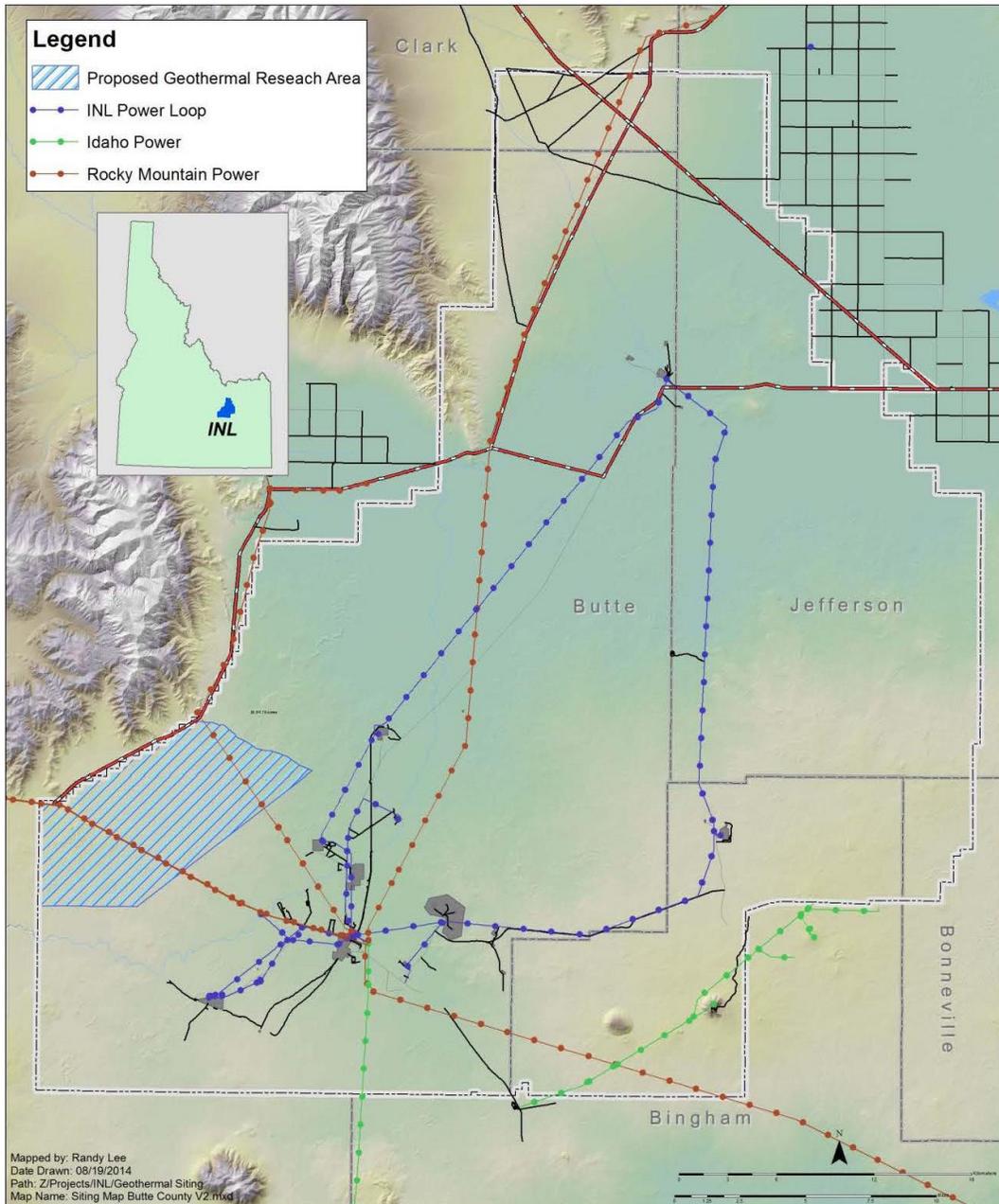
The EGS laboratory will have an extremely small environmental footprint and impact. We expect the EGS water used in the process will be approximately the same quality as the ESRPA both before and after use. ***It is important to note that the operation of the EGS process is not the same as that used in oil and gas “fracking,” where the production and disposal of contaminated production water is an issue.*** In the EGS application, high quality water will be used during reservoir creation, and similarly high quality water will be continuously circulated between the two EGS wells during the mock-up of a commercial operation. The deep rocks of the ESRP are volcanic and will not create the high salinity waters produced from marine origin sedimentary rocks.. Sedimentary rocks with high salinity and high dissolved solids content are common in oil and gas fields (see Table 1 for a comparison of chemistry of “Flow Back” water from oil and gas operations in North Dakota and ESRP waters).

The EGS laboratory will develop, improve and verify the technologies necessary to bring low carbon geothermal electricity into the mainstream USA energy portfolio. A essential part of project is to provide data and results that will give industry the confidence to safely adopt these technologies. We envision the benefits of commercialization of EGS to move out from the INL field laboratory to southeastern Idaho—providing environmentally safe, baseload electricity, creating jobs, and enhancing the quality of life in the region.

For more information, please contact Dr. Robert Podgorney, the Director of the Snake River Geothermal Consortium, at [robert.podgorney@inl.gov](mailto:robert.podgorney@inl.gov).



**Fig. 1. Conceptual drawing of the INL EGS field test site, and steps required for development.**



**Map of the Idaho National Laboratory showing the “Geothermal Resource Research Area,” where the EGS field laboratory will potentially be located.**

Table 1. Typical chemical concentrations in water samples for the ESRP shallow aquifer, deep thermal system and flow-back from a natural gas well in the Bakken formation in North Dakota.

Constituents	USEPA MCL <sup>a</sup> (mg/l)	Shallow ESRP Aquifer Water <sup>b</sup> (mg/l)	Deep ESRP Water <sup>c</sup> (mg/l)		Flow-back Water Bakken Formation <sup>d</sup> (mg/l)
			Sturm	INEL-1	
pH		7.8	8.73	8.2	5.62
Ca		43	3.2	8.1	13,500
K		3	0.9	8.3	5770
Mg		16	0.048	0.9	1440
Na		14	33	363	62,700
SiO <sub>2</sub> (aq)		24	63	40	6.4
Cr	0.100	0.006		0.007	
Fe		0.06		1.0	72
Mn		0.005		0.07	10
Pb	0.015 <sup>e</sup>	0.002			
Li		0.008	0.05	0.29	
Cd	0.005	0.0001			
Al		0.005	0.005		<1
As	0.01	0.002	0.012	0.03	
Se	0.050	0.002	0	0	
Rb		0.006	0.004		
Sr		0.2	0.005	0.14	1010
Ba	2	0.06	0.001		24.6
B		0.03	0.039	0.56	39.9
HCO <sub>3</sub>		180	62.33	830	140
F	4	0.3	2.1	12.7	
Cl		25	3.3	14	133,000
SO <sub>4</sub>		24	5.8	88	300
NO <sub>3</sub>	10	5	0.6298		
U	0.03 <sup>f</sup>	0.002			
TDS		450	106	964	218,000

<sup>a</sup> USEPA maximum contaminant level (MCL) in drinking (USEPA, 2009)

<sup>b</sup> Average ESRPA water composition for water samples from several wells within and near INL site (calculated USGS data set reported by Busenberg et al., 2000).

<sup>c</sup> Sturm well water composition is from INL unpublished data and average composition of deep INEL-1 is calculated using data from Mann (1986).

<sup>d</sup> Composition flowback water from a Bakkan Formation well (Well # C/2) (Stepan et al., 2010)

<sup>e</sup> If more than 10% of tap water samples exceed the action level (0.015 for Pb), water systems must take additional steps.

<sup>f</sup> As of 12/08/2003.

## Attachment 5 Presentation on Potential Seismic Activity



*The Snake River Geothermal Consortium is a research partnership focused on advancing geothermal energy, hosted by Idaho National Laboratory.*



**Enhanced Geothermal Systems: A reNewable Energy Future for Idaho?**

Ketchum, ID  
January 2016

Robert K. Podgorney, PhD, PG  
Idaho National Laboratory  
Director, Snake River Geothermal Consortium



**Snake River Geothermal**  
CONSORTIUM



[snakerivergeothermal.org](http://snakerivergeothermal.org)

### **Why Am I Here?**

Several Reasons:

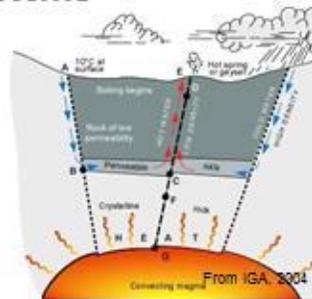
- To introduce myself and make you aware of a research project regarding geothermal energy on the Snake River Plain
- To raise awareness of the huge potential for geothermal energy
- To get your thoughts and ideas
- To let you know why this is important to you!

## Why is Geothermal Energy Important?

- It's renewable...
  - "Inexhaustible" supply of heat from earth's core
  - ~30 year operational life of powerplant, 100 year heat recharge
- It's clean...
  - Nearly 0 GHG emissions
  - Typical geothermal plant <1% of CO<sub>2</sub> emission of typical coal plant
- It's available 24/7...
  - No intermittency issues like those with solar, wind, etc
  - Firming or baseload in conjunction with intermittent renewables
- It's abundant and has large potential for expansion...
  - Current world capacity ~ 13 GW
  - US potential reportedly 40 GW with current technology
  - 1 GW can generally power 1,000,000 homes

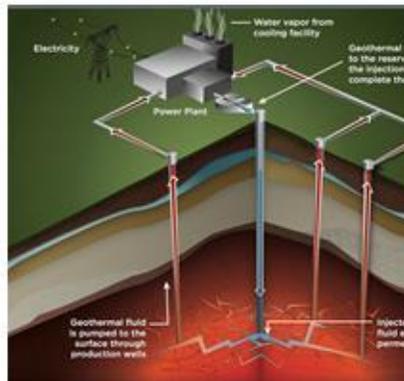
## Conventional Geothermal Systems

- "Hydrothermal" system
- Geothermal system is made up of three general components
  - Heat Source
  - Reservoir
  - Heat transfer fluid
- Convection and conduction control from below
- Permeability is necessary
- Limited geographic extent



## Enhanced Geothermal Systems

- Drill deep enough you'll find heat
- "Engineer" a reservoir
- Circulate a working fluid
- Make geothermal "portable"
- But...all the necessary technologies aren't proven



## FORGE: Frontier Observatory for Research in Geothermal Energy

- Purpose of FORGE is to "prove the principle" of Enhanced Geothermal Systems, provide the data necessary for industry adoption
- Promote transformative science and engineering to:
  - Validate and optimize EGS technology
  - Creation of productive and sustainable reservoirs
  - Ensure reproducibility for commercial scaling
  - Federal Role—take technical risks not possible in private sector
  - Capture and disseminate high fidelity data in real-time
- Facilitate broad collaboration
  - Stakeholders and scientific communities
  - Welcome a wide-range of R&D performers



## Why *FORGE* and EGS?

- EGS greatly expands the number of locations that could produce electricity from geothermal resources
- Few places of sufficient size have all three characteristics needed for conventional geothermal development (heat, fluids, and permeability) and finding them can be difficult and expensive
- While EGS is promising, more research is needed to advance the technology so it can be deployed commercially
- US potential reportedly 100-1,200 GW in next 50 years with EGS

### Potential geothermal resources in 13 Western states:

Source: U.S. Geological Survey



## The Timeline

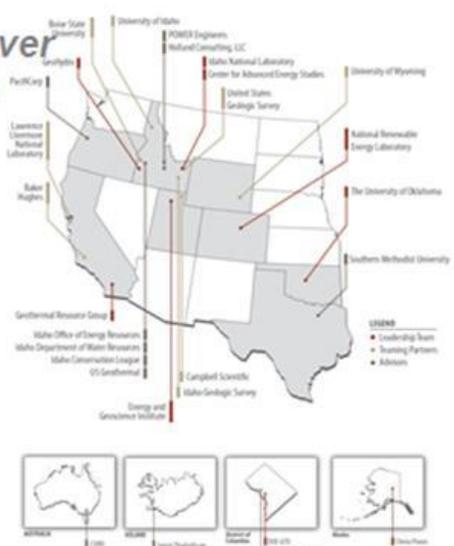
- **Phase 1** – screening level, 5 projects in competition. Ends early June 2016 with a down select to up to 3 sites.
- **Phase 2** – site characterization permitting. This can be between 12-24 months, and will include significant field work, permitting, etc. All work be completed in compliance with regulations. This will occur through most of 2016-2017. This phase ends with a down select to 1 site.
- **Phase 3** – establishes the field lab. A total of 5 years planned for the duration (until 2023), all subject to funding authorizations. This is deep well drilling, flow tests, and a bunch of other research that is to be determined. All will be completed in compliance with regulations.

**Snake River Geothermal**  
CONSORTIUM


  
[snakerivergeothermal.org](http://snakerivergeothermal.org)

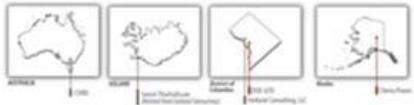
### Our Team: The Snake River Geothermal Consortium

- **Technical Team**
  - 3 National Labs
  - 6 Universities
  - 3 Federal/State Institutions
  - 6 Industry Partners
- **Advisory Panel formed**
  - Holland Consulting
  - POWER Engineers
  - US Geothermal



**USING**

- Leadership Team
- Funding Partners
- Advisors


  
 Australia, Iceland, New Zealand, United Kingdom

**Snake River Geothermal**  
CONSORTIUM


  
[snakerivergeothermal.org](http://snakerivergeothermal.org)

### Our Vision for FORGE

- Establish FORGE as a community resource for geothermal and other programs
- Bring INL's unique capabilities and infrastructure to bear. Leverage our leadership in Performance Science
  - Unique history of geothermal demonstrations and other user facilities
- Bring oil and gas technologies to geothermal and jump the development curve. Learn from the development of shale gas
  - Build industry-academia-lab team with strong oil and gas credibility, as well as long history in geothermal energy and environmental stewardship
- Educate the public and next generation of scientists and engineers
  - Modern communication tools to inform and educate the public
  - Significant STEM program
  - Real time data sharing for transparency and trust
- **Take EGS from concept to commercial**

**Snake River Geothermal**  
CONSORTIUM

  
[snakerivergeothermal.org](http://snakerivergeothermal.org)

### What Does it Look Like?

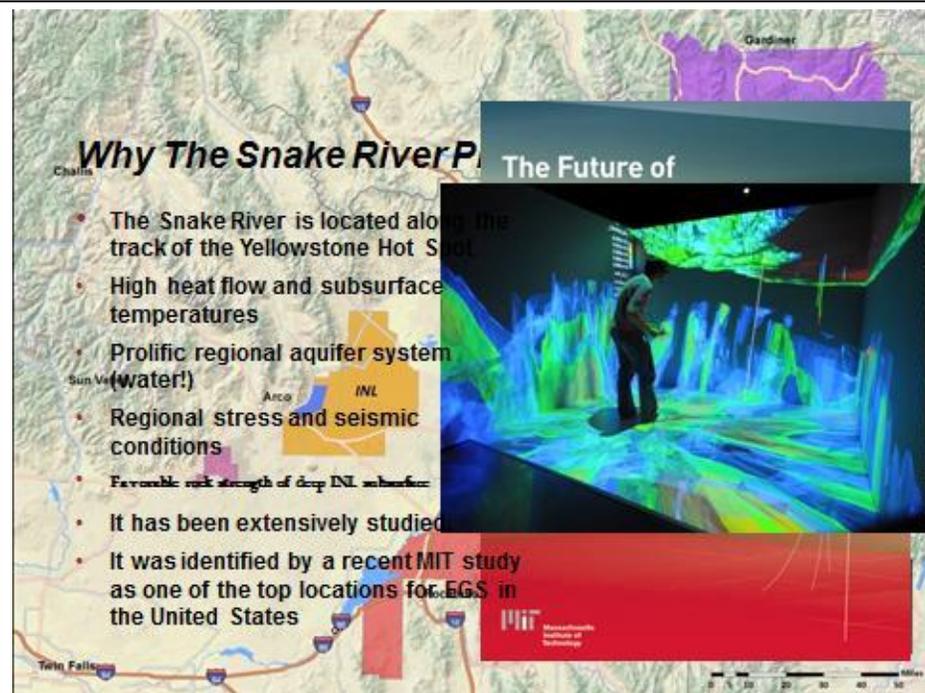


**EGS is NOT the same as Oil and Gas "Fracking"**

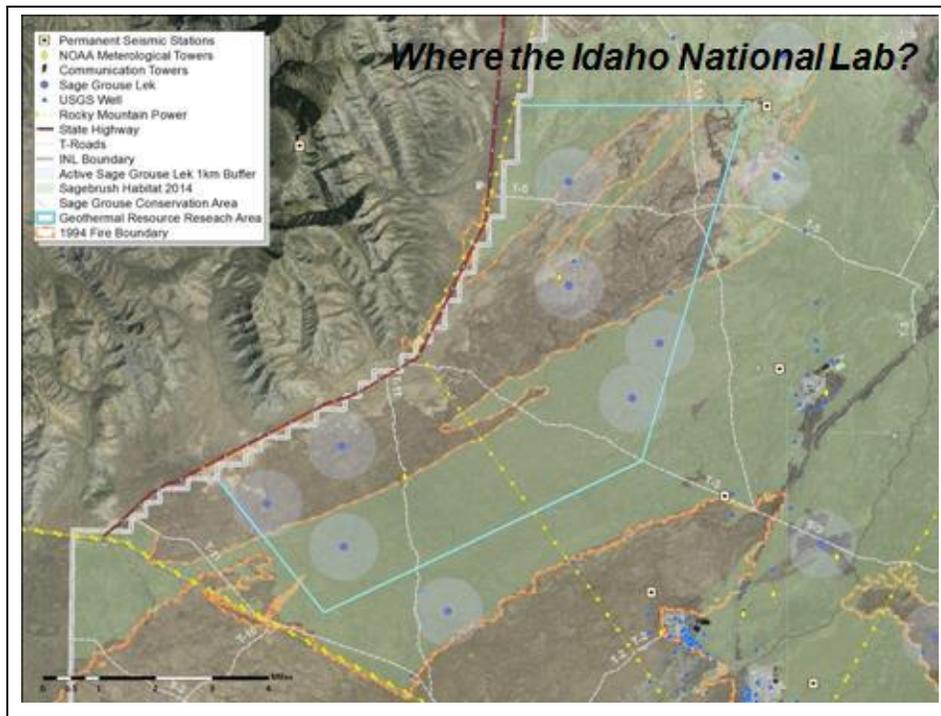
Still an active area of planning, but key is long-run horizontal (or sub-horizontal) wells with multiple completion options. Design wells to be reentered and recompleted as necessary.

### Why The Snake River P... The Future of

- The Snake River is located along the track of the Yellowstone Hot Spot
- High heat flow and subsurface temperatures
- Prolific regional aquifer system (water!)
- Regional stress and seismic conditions
- Favorable rock strength of deep INL subsurface
- It has been extensively studied
- It was identified by a recent MIT study as one of the top locations for EGS in the United States

  
 Massachusetts Institute of Technology



## Questions?



### *What is available locally?*

- Some exploratory work done in the area—but not much
- There is a potential electrical generation resource
  - Magic HS
  - ~150-160 F water (estimates to 300 F resource)
- Much direct use potential
  - Most regional HS could be used for heating



*OK, but what are the concerns????*

## *OK, but what are the concerns????*

It will ruin the groundwater



## *Frack "Flowback" Water Characteristics*

- Data from Williston Basin
- Relatively low recovery of the original frack water in first 10 days
  - Ranges from 15-50%
- Very high salinity
  - Up to 220,000 mg/l
  - Mostly NaCl with lesser amounts of calcium, potassium, and sulfate
- Also "NORMs"



### Raft River Geothermal Waters



### Geothermal Water Chemistry Data

- We will not be anywhere even close to INL facilities, or areas with contamination

Constituents	USEPA MCL* (mg/l)	Shallow ESRP Aquifer Water <sup>1</sup> (mg/l)	Deep ESRP Water <sup>2</sup> (mg/l)		Flow-back Water Bakken Formation <sup>4</sup> (mg/l)
			Steam	INEL-1	
pH		7.3	8.73	8.2	5.62
Cl <sup>-</sup>		45	3.2	5.1	1,330
K		3	0.9	3.3	3770
Mg		16	0.048	0.9	1440
Na		14	33	363	62,700
SiO <sub>2</sub> (aq)		24	63	40	5.4
Ca <sup>2+</sup>	0.100	0.006		0.007	
Fe <sup>2+</sup>		0.06		1.0	72
Mn <sup>2+</sup>		0.005		0.07	10
PS	0.015*	0.002			
Li		0.008	0.05	0.29	
Cd	0.005	0.0001			
Al <sup>3+</sup>		0.005	0.005		41
As <sup>3+</sup>	0.01	0.002	0.015	0.03	
Se <sup>2-</sup>	0.050	0.002	0	0	
Ag <sup>+</sup>		0.006	0.004		
Br <sup>-</sup>		0.2	0.005	0.14	101.0
Ba <sup>2+</sup>	2	0.06	0.001		34.6
B	0.03	0.03	0.039	0.36	32.9
HCO <sub>3</sub> <sup>-</sup>		1.90	62.33	330	140
F <sup>-</sup>	4	0.3	2.1	12.7	
Cl <sup>-</sup>		25	3.3	14	133,000
SO <sub>4</sub> <sup>2-</sup>		24	3.8	33	300
NO <sub>2</sub> <sup>-</sup>	10	5	0.0298		
U	0.03 <sup>†</sup>	0.002			
TDS		4.50	70.6	364	213,000

Typical chemical concentrations in water samples for the ESRP shallow and deep aquifer and flow-back from a natural gas well in the Bakken formation.

## *OK, but what are the concerns????*

2. It will cause earthquakes!!!

## *What is an Earthquake?*

- When two bodies of rock slide past each other (rupture)
- Energy is radiated out from the rupture in all directions (seismic waves)
- Seismic waves travel to seismic stations and help locate and determine the size of the earthquake (magnitude)



## General Earthquake Relationships

- Gutenberg-Richter Scaling Law

For every one magnitude 5 earthquake there are roughly

Number of Events	Magnitude	"Intensity"
10	4	Felt by Many
100	3	Felt by Some
1000	2	Generally not Felt
10000	1	
100000	0	
1000000	-1	



1959 Hebgen Lake Earthquake  
M7.5

## General Earthquake Relationships

- Gutenberg-Richter Scaling Law

For every one magnitude 5 earthquake there are roughly

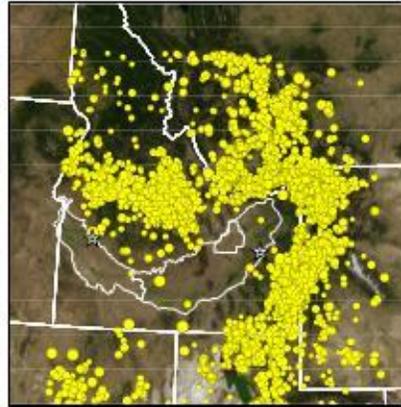
Number of Events	Magnitude	"Intensity"
10	4	Felt by Many
100	3	Felt by Some
1000	2	Generally not Felt
10000	1	
100000	0	
1000000	-1	



This is the range we're talking about

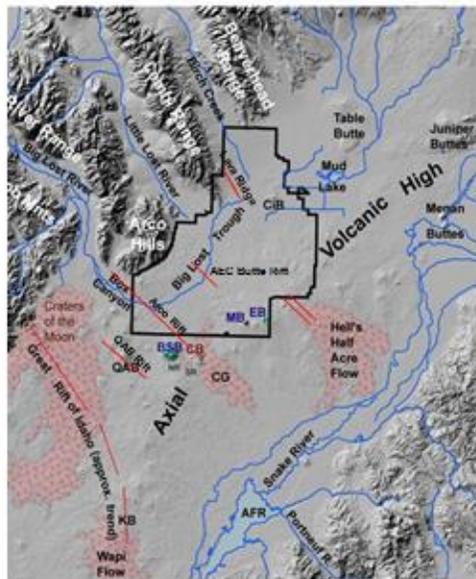
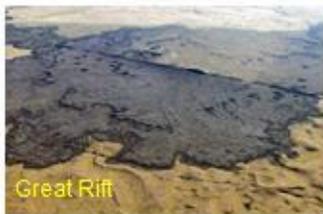
## Seismic Events on the Snake River Plain Are Rare

- Seismically quiet
  - The Snake River Plain is seismically quiet compared to the surrounding basin and range mountains
- Mount Borah earthquake (M7.3)
  - 1983 Epicenter located about 100km (70) miles from INL's facilities, but no significant damage occurred
- Events on the ESRP proper are very few, and very deep
  - Allow for detailed monitoring for injection events



## Why So Rare?

- Regional stress state of the earth's crust isn't conducive to generating earthquakes
- "Extensional" regime, which means we're not "building up" energy
- Numerous rift zones



## *OK, So Why Should You Care?*

- We have the opportunity to make a difference
  - Clean renewable energy with a small footprint
  - Education and outreach
- There are many R&D areas/career opportunities with FORGE
  - Geosciences (of course), but also
  - Engineering of many disciplines
  - Modeling and Simulation
  - Grid/Hybrid/Integration
  - Biology and Chemistry
- Education
  - CAES plus other universities
  - Support for faculty and students
  - Student research supports R&D phase, and prepares the workforce
  - K12 STEM

## *Questions?*



## ***Well Stimulation has been done in Idaho before***

- The Smoke Ranch Well isn't the first "fracking" job in Idaho
- Groundwater wells have been "stimulated"
- Raft River Geothermal Field near Malta
  - Stimulated in the late 1970's—early 1980's
  - First demonstration of this for geothermal wells
  - Undergoing a DOE study on well stimulation for *Enhanced Geothermal Systems*



## ***Research Opportunities***

- Many R&D areas/career opportunities applicable to FORGE
  - Geosciences (of course), but also
  - Materials
  - Modeling and Simulation
  - Grid/Hybrid/Integration
  - Biology and Chemistry
  - Engineering of many disciplines
- Education
  - CAES plus other universities
  - Support for faculty and students
  - Student research supports R&D phase, and prepares students for the workforce

## ***EGS Development Steps***

### **Step 1: Identify/Characterize a Site**

- Develop a geologic model of a potential site via surface, geologic, geophysical, and remote sensing exploration
- Assess the temperature gradient, permeability, in-situ stress directions, rock mechanical properties, and whether fluid is present

### **Step 2: Create a Reservoir**

- Drill an injection well into hot rock with limited fluid content and/or permeability
- Inject water at sufficient pressure (or temperature differential) to create a fracture network
- Continue operation until there is enough fractured volume to create a reservoir (flow rate, temperature, volume, and sustainability)
- Drill a production well into the fracture network

### **Step 3: Operate the Power Plant and Maintain the Reservoir**

- At the surface, the water flashes to steam, or it heats a working fluid that produces vapor
- The steam/vapor turns a turbine to create electricity
- The original geothermal water is recycled into the reservoir through the injection well to complete the circulation loop

## Attachment 6 INL Water Rights

7011425

*Amie Hove*

ID11425

### WATER RIGHTS AGREEMENT

\* \* \* \* \*

Between The State Of Idaho  
And The United States,  
For The United States  
Department of Energy

WATER RIGHTS AGREEMENT  
BETWEEN THE STATE OF IDAHO AND  
THE UNITED STATES,  
FOR THE UNITED STATES DEPARTMENT OF ENERGY

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APPENDIX

Notice of Claim to Water Right No. A25-07263  
Notice of Claim to Water Right No. A35-12693  
Notice of Claim to Water Right No. A36-13983  
Notice of Claim to Water Right No. A86-10673

WATER RIGHTS AGREEMENT BETWEEN THE STATE OF IDAHO  
AND THE UNITED STATES, FOR THE UNITED STATES DEPARTMENT OF ENERGY

The State of Idaho and the United States agree as follows:

1. Preamble

- 1.1 The State of Idaho, pursuant to Idaho Code § 42-1406A (Supp. 1989) has commenced a general adjudication of the rights to the use of the water from that portion of the Snake River Basin located in the State of Idaho.
- 1.2 Idaho Code § 42-1409(3) (Supp. 1989) provides that a claimant of a water right reserved under federal law may submit a negotiated agreement between the State of Idaho and the claimant in lieu of a notice of claim.
- 1.3 Executive Order Nos. 85-9 and 87-9 provide that it is in the interest of the State of Idaho to quantify Federal Reserved Water Rights through negotiations.
- 1.4 The State of Idaho and the United States desire to exercise the right to submit a negotiated agreement quantifying, in part, the rights of the United States to the use of water, pursuant to both federal and Idaho law for the Department of Energy within the Snake River Basin in Idaho.

2. Definitions

- 2.1 The following definitions apply for the purpose of this Agreement:
  - .1 "Acre foot" or "AF" means the amount of water necessary to cover one acre of land to a depth of one

WATER RIGHTS AGREEMENT--Page 1 of 17

- foot and is equivalent to 43,560 cubic feet or 325,851 gallons.
- .2 "Acre feet per year" or "AFY" means the number of acre feet of water used in a calendar year commencing January 1 and ending December 31.
  - .3 "Aquifer" means a geologic formation, group of formations, or part of a formation or other body of earth material capable of transmitting water at a rate sufficient for water supply purposes.
  - .4 "Cubic feet per second" or "CFS" is a unit expressing the rate of discharge. One CFS is equivalent to 448.83 gallons per minute.
  - .5 "Consumptive use" means the amount of water that is used by any action or process and is not returned to the water system.
  - .6 "Director" means the Director of the Idaho Department of Water Resources and his successors.
  - .7 "Diversion" means the removal of water from its natural course or location by means of a ditch, canal, flume, bypass, pipeline, conduit, well, pump, or other act of man, or the impoundment of water in a reservoir.
  - .8 "Department of Energy" means the United States Department of Energy, which was created by the Department of Energy Organization Act of August 4, 1977, Pub. L. 95-91, 91 Stat. 565, and its successors.

- .9 "IDWR" means the Idaho Department of Water Resources and its successors.
- .10 "Idaho National Engineering Laboratory" or "INEL" refers to an area of land approximately 890 square miles in size and 50 miles west of Idaho Falls, which was originally acquired or reserved in the following public land orders or condemnation cases:
  - .i Public Land Order 318 dated May 13, 1946, withdrew and reserved public lands for the use of the Department of Navy as part of a Naval Proving Ground. The public and nonpublic lands aggregate 156,832.75 acres.
  - .ii Public Land Order 545 dated January 7, 1949. This public land order withdrew and reserved 640 acres of public lands for the use of the Department of Navy as part of a Naval Proving Ground.
  - .iii Public Land Order 637 dated April 7, 1950, withdrew and reserved public lands for the use of the United States Atomic Energy Commission as a Reactor Testing Station. The public and nonpublic lands aggregate 259,549.8 acres.
  - .iv Public Land Order 691 dated December 5, 1950, transferred from the Department of Navy to the Atomic Energy Commission the lands reserved by

- Public Land Order Nos. 318 and 545 for use in the atomic-energy program.
- .v Public Land Order 1770 dated December 19, 1958, withdrew and reserved 123,648 acres of public lands for use of the Atomic Energy Commission in connection with the National Reactor Testing Station in the vicinity of Arco, Idaho.
- .vi United States v. 18,217.58 Acres of Land, More or Less, in Butte and Jefferson Counties, Idaho, No. 1227E (D. Idaho October 29, 1945) (preliminary order of condemnation).
- .vii United States v. 15,357.16 Acres of Land in Butte, Bingham, and Jefferson Counties, State of Idaho, No. 1624 (D. Idaho September 19, 1951) (final order of condemnation).
- .viii United States v. 8617.87 Acres of Land, More or Less, in the Counties of Clark, Butte, Jefferson, Bonneville, and Bingham, State of Idaho, No. 2160 (D. Idaho April 27, 1959) (judgment).
- .11 "Parties" means the United States and the State of Idaho.
- .12 "Person" means an individual, a partnership, a trust, an estate, a corporation, a municipal corporation, the State of Idaho or any political subdivision, the United States, an Indian tribe, or any other public or

private entity. Idaho Code § 42-1401A(8) (Supp. 1989).

- .13 "Snake River Basin Adjudication" or "SRBA" means Civil Case No. 39576 filed in the Fifth Judicial District Court of the State of Idaho in and for Twin Falls County on June 17, 1987, entitled In Re the General Adjudication of Rights to the Use of Water from the Snake River Basin Water System, which was commenced pursuant to Idaho Code § 42-1406A (Supp. 1989).
- .14 "State" means the State of Idaho.

### 3. Scope of Agreement

- 3.1 The purpose of this Agreement is to quantify all existing water rights and claims to water rights of the United States under state and federal law for the use by the Department of Energy in the Snake River Basin in the State, except for the following claims to water rights: Claim Nos. A25-07263, A35-12693, A36-13983 and A86-10673, which have been lodged in the SRBA. Copies of the claims are attached hereto and incorporated herein by reference.
- 3.2 This Agreement relates to all waters on, under, adjacent to, or otherwise appurtenant to the Department of Energy facilities or lands in the State, except as noted in Article 3.1.

**4. Parties and Authority**

- 4.1 The Governor has authority to negotiate and execute this Agreement pursuant to Idaho Code § 67-802 (1989) and 1990 Idaho Sess. L., ch. 259.
- 4.2 The Idaho Water Resource Board has authority to negotiate and execute this Agreement pursuant to Idaho Constitution, art. XV, § 7, Idaho Code § 42-1734(3) (Supp. 1989) and Executive Order Nos. 85-9 and 87-9.
- 4.3 The Idaho Attorney General has authority to negotiate and execute this Agreement pursuant to his authority to settle litigation as provided for in Idaho Constitution, art. IV, § 1, and Idaho Code § 67-1401 (Supp. 1989) and 1990 Idaho Sess. L., ch. 259.
- 4.4 The United States Attorney General and any duly designated official of the Department of Justice have authority to execute this Agreement pursuant to the authority to settle litigation contained in 28 U.S.C. § 516-517.
- 4.5 The Secretary of the Department of Energy and any duly designated official of the Department of Energy have authority to execute this Agreement pursuant to The Department of Energy Organization Act of August 4, 1977, Pub. L. 95-91, 91 Stat. 565.

**5. Water Right of the United States**

- 5.1 The name and address of the claimant for the water right negotiated and settled by this Agreement is as follows:

United States of America  
c/o Department of Energy  
Idaho Operations Office  
785 DOE Place  
Idaho Falls, Idaho 83402

5.2 Water right for consumptive use at the INEL:

.1 Right No. A34-10901

.i Source: Ground water

.ii Amount of Water: The maximum rate of diversion from any and all wells shall not exceed 80 CFS, and the maximum annual diversion shall not exceed 35,000 AFY.

.iii Date of Priority: April 7, 1950

.iv Points of Diversion: Any point within the boundaries of the INEL. Existing and new points of diversion will be reported as described in Article 6.2.

.v Purpose of Use: The primary purposes authorized by Congress for INEL.

.vi Period of Use: January 1 - December 31.

.vii Annual Volume of Consumptive Use: Not to exceed 35,000 AFY.

.viii Place of Use/Legal Description of Reservation: Any place within the boundaries of the INEL.

.ix Basis of Right: Federal Reserved Water Right.

.x Comments: None.

5.3 The United States may also divert water for fire suppression at INEL in accordance with the following

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paragraph proposed to be included in the final decree in this matter:

"The use of water for fire suppression benefits the public. Water diverted for fire suppression may be taken randomly, without a definition of the specific elements of a recordable water right, and if so diverted for fire suppression, existing water rights shall not be diminished."

- 5.4 The right described in this Agreement is a Federal Reserved Water Right with all the characteristics appertaining thereto. Non-use of all or any part of the Federal Reserved Water Right shall not constitute a relinquishment, forfeiture or abandonment of the right.

**6. Administration of Water Rights**

- 6.1 Administration. The parties are unable to agree upon whether the issue of administration is ripe or otherwise appropriate for decision in the SRBA, and if so, whether and to what extent the Director has authority to administer federal water rights. Accordingly, this Agreement does not address this issue except as expressly provided in Article 6.2. Each party reserves the right to litigate the issue of administration, if and when the need arises.

6.2 Access to and Monitoring of Measuring Devices

- .1 The State and the United States mutually assure and agree to provide access and cooperation for

installation and utilization of measuring devices needed for management of the water resources on INEL; provided, however, that access to the INEL will be in accordance with all federal laws and regulations governing access to the INEL.

- .2 The Department of Energy voluntarily agrees to provide the State with a comprehensive inventory of all wells (monitoring, production and disposal) at or relating to activities at the INEL. This inventory will include information on the total depth of each well and depth to water, detailed well construction information, well logs, usage information, including detailed information on quantity and quality of fluids discharged, and dates of installation and retooling. Department of Energy will update such information to reflect any plans to construct and actual construction of new wells. As long as paragraph C.4. of Attachment A of the Environmental Oversight and Monitoring Agreement between the Department of Energy and the State of Idaho dated May 21, 1990 remains in effect as originally written, the report provided to the State pursuant to that paragraph will constitute compliance with this paragraph. If paragraph C.4. of Attachment A of the Environmental Oversight and Monitoring Agreement is amended or no longer effective, then the

Department of Energy will separately comply with this paragraph unless otherwise mutually agreed.

- .3 The Department of Energy will continue to maintain the water measuring devices it has installed on each existing well used to deliver its water right described in Article 5. The Department of Energy may develop new points of diversion for the water right described in Article 5 and agrees to install a water measuring device on each new point of diversion. The Department of Energy shall monitor each measuring device used to deliver the water right described in Article 5 and report the results each year to the IDWR by March 1st of the year after the reporting year or at such other time as requested, upon reasonable notice. Results reported to IDWR shall include annual volume of water diverted, maximum and average diversion rates and pumping level (water depth).
- .4 IDWR shall provide the Department of Energy, at its request, any water district or water measurement report prepared by or for IDWR and any other requested nonprivileged public information in the possession of the State concerning the use of water by other persons.

#### 7. Water Transfer

- 7.1 The United States shall not transfer the Federal Reserved Water Right described in Article 5.2.1.

8. Finality of Settlement Agreement

- 8.1 The parties understand that this Agreement will be submitted to the Director in lieu of a notice of claim in the SRBA, that the Director will submit this Agreement and an abstract of the Agreement to the Fifth Judicial District Court of the State of Idaho in and for the County of Twin Falls as part of a Director's Report, and that state law allows other persons not signatory to this Agreement to file objections to the approval of this Agreement by the Fifth Judicial District Court of the State of Idaho in and for the County of Twin Falls.
- 8.2 The United States agrees that License Nos. 34-2292 [old no. 21253] and 34-2278 [old no. 19993] will be superseded by the water right identified herein, only upon completion of all judicial proceedings, including appeals if any, together with entry of a final decree containing the water right described in this Agreement. The parties agree that water right claim nos. A25-07263, A35-12693, A36-13983, and A86-10673 shall not be affected by the execution of this Agreement and that water right claim nos. A25-07263, A35-12693, A36-13983, and A86-10673 will be adjudicated in accordance with Chapter 14 of Title 42 of Idaho Code to the extent it is applicable.
- 8.3 The parties agree to jointly support and defend this Agreement against any and all objections or other

challenges that may arise in any phase of the SRBA, including any appeals, and in securing any necessary ratification of the Agreement.

- 8.4 The United States' water right for the INEL confirmed in Article 5 shall be final and conclusive as to all parties to the SRBA upon the completion of all judicial proceedings, including any appeals, relative to this Agreement.

**9. Disclaimers and Reservation of Rights**

- 9.1 This Agreement contains a complete statement of all water rights held by the United States on behalf of the Department of Energy. The United States claims no other existing water rights, under either state or federal law, to the use of water for the Department of Energy within the Snake River Basin in Idaho.
- 9.2 The United States on behalf of the Department of Energy disclaims any right to seek the maintenance of any specific pumping level for the water right described in Article 5.2.
- 9.3 The United States on behalf of the Department of Energy disclaims any interest in or claim to water for the Department of Energy from the Snake River Basin Water System as defined in the SRBA other than as expressly set forth in this Agreement.
- 9.4 This Agreement represents a settlement of a water right that is unique to the INEL. The parties are unable to

agree on whether the Federal Reserved Water Rights doctrine extends to ground water. In order to avoid litigation, however, this Agreement recognizes a Federal Reserved Water Right, as described in Article 5. Because this Agreement is a resolution of a disputed claim, it is not and shall not be used as precedent for any other Federal Reserved Water Right claim in the SRBA.

- 9.5 This Agreement has been reached in the process of good faith negotiations for the purpose of resolving legal disputes, including pending litigation, and all parties agree that no offers and/or compromises made in the course thereof shall be construed as admissions against interest or be used in any legal proceeding other than one for approval, confirmation, interpretation, or enforcement of this Agreement.
- 9.6 Entry of judgment as set forth above has been consented to by the parties without trial or adjudication of fact or law herein and without the judgment constituting evidence or an admission by any party, with respect to any such issue, which is, will be, or could be litigated in any proceeding other than the SRBA. See McShan v. Omega Louis Brandt et Frere, S.A., 536 F.2d 516, 519 (2d Cir. 1976). Once this Agreement becomes effective as provided by Article 15.1, the water right described in Article 5 of this Agreement shall be binding upon all parties to the SRBA, whether signatory to the Agreement or not.

9.7 Nothing in this Agreement shall be construed or interpreted:

- .1 To establish any standard to be used for the quantification of Federal Reserved Water Rights in any judicial or administrative proceeding;
- .2 To restrict the acquisition by the United States of any appropriative water right under State law; provided, however, that prior to applying for a permit to appropriate water for use at the INEL, the United States must demonstrate that the water right described in Article 5 is fully used at the time the application is made;
- .3 To restrict the United States' power to reserve land or water rights in the future, in accordance with applicable law;
- .4 To restrict the United States' power to acquire land in the future, in accordance with applicable law;
- .5 To determine the relative rights inter sese of persons using water under the authority of the State or to authorize the taking of a water right which is vested under state or federal law;
- .6 To limit in any way the rights of the parties or any person to litigate any issue or question not resolved by this Agreement;
- .7 To limit the authority of the United States to manage its lands or water rights in accordance with the

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Constitution, statutes, regulations, and procedures of the United States;

- .8 To preclude the State or the United States from exercising whatever authority each sovereign government may have to regulate water quality;
- .9 To apply to any water rights of the United States other than its water rights for use by the Department of Energy in Idaho;
- .10 To commit or obligate the United States to expend funds that have not been appropriated and budgeted;
- .11 To restrict, enlarge, or otherwise determine the jurisdiction of any court, state or federal; and
- .12 To constitute an admission by the State of the validity of Water Right Claim Nos. A25-07263, A35-12693, A36-13983 and A86-10673.

**10. Severability**

- 10.1 This Agreement is not severable.

**11. Successors**

- 11.1 This Agreement shall bind and inure to the benefit of the respective successors of the parties.

**12. Entire Agreement**

- 12.1 This Agreement sets forth all the covenants, promises, provisions, agreements, conditions, and understandings between the parties and there are no covenants, provisions, promises, agreements, conditions, or understandings, either

oral or written between them other than are herein set forth.

**13. Effect of Headings**

13.1 Headings appearing in this Agreement are inserted for convenience and reference and shall not be construed as interpretations of the text.

**14. Multiple Originals**

14.1 This Agreement is executed in quadruplicate. Each of the four (4) Agreements with an original signature of each party shall be an original.

**15. Effective Date**

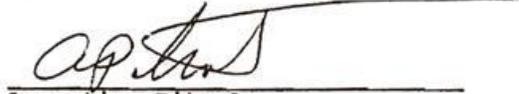
15.1 This Agreement shall be effective when all of the following events have occurred:

- .1 This Agreement is executed; and
- .2 The right described in Article 5 of this Agreement has been confirmed in a decree in the SRBA and such decree has become final and nonappealable.

The parties have executed this Agreement the date following their respective signatures.

  
Cecil Andrus  
Governor, State of Idaho

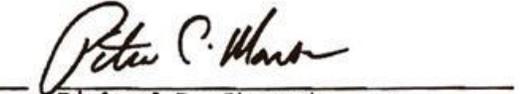
\_\_\_\_\_  
Date

  
Augustine Pitrolo  
Manager, Idaho Operations Office  
U.S. Department of Energy  
JUL 11 1980

\_\_\_\_\_  
Date

  
Jim Jones  
Attorney General,  
State of Idaho

\_\_\_\_\_  
Date

  
for Richard B. Stewart  
Assistant Attorney General  
Land and Natural Resources  
Division  
U.S. Department of Justice

7/20/80  
\_\_\_\_\_  
Date

  
Gene Gray, Chair  
Idaho Water Resource Board

\_\_\_\_\_  
Date