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

Environmental, Safety, and Health Plan

April 2016

SRG Consortium | Snake River Geothermal

FORGE U.S. Department of Energy

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Environmental, Safety, and Health Plan

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Snake River Geothermal Consortium
Hosted by Idaho National Laboratory
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CONTENTS

FIGURES

ACRONYMS

AIR	Air Idaho Rescue
CAES	Center for Advanced Energy Studies
CFA	Central Facilities Area
CT	computed tomography
DOE	U.S. Department of Energy
EA	environmental assessment
EC	environmental checklist
EES&T	Energy and Environment Science and Technology
EIRMC	Eastern Idaho Regional Medical Center
EMS	Environmental Management System
EMT	emergency medical technician
ES&H	environmental, safety, and health
ESH&Q	Environment, Safety, Health and Quality
FAC	Fire Alarm Center
FORGE	Frontier Observatory for Research in Geothermal Energy
INL	Idaho National Laboratory
ISMS	Integrated Safety Management System
LI	laboratory instruction
LWP	laboratory-wide procedure
NEPA	National Environmental Policy Act
PPE	personal protective equipment
RD	requirements document
R&D	research and development
SME	subject matter expert
SRGC	Snake River Geothermal Consortium
VPP	Voluntary Protection Program
WCC	Warning Communications Center

Environmental, Safety, and Health Plan

1. INTRODUCTION

This plan describes the measures used to mitigate or eliminate hazards associated with the Frontier Observatory for Research in Geothermal Energy (FORGE). FORGE marks the U.S. Department of Energy's (DOE's) largest effort to advance the deployment of enhanced geothermal systems. These systems have the potential to tap into a conservatively estimated 100 GW of baseload power-generating capacity by harnessing the earth's heat through engineered geothermal reservoirs. The FORGE project aims to develop methodologies and technologies that will bring this resource into the nation's energy portfolio (Metcalfe, 2015). This project is being performed by the Snake River Geothermal Consortium (SRGC) at the 110-km^2 (42.6-mi^2) Geothermal Resource Research Area on the Idaho National Laboratory (INL) Site.

Because INL is hosting FORGE, the SRGC will conduct the FORGE project under INL's extensive, mature, and effective environmental, safety, and health (ES&H) program, which is capable of mitigating hazards to human health and the environment posed by Phases 2 and 3 of the project. Under this arrangement, the FORGE field operations manager estimates that the annual cost to FORGE for ES&H support service will amount to less than 10% of one full-time equivalent employee, which is less than 200 labor hours per fiscal year.

INL's Environmental Management System (EMS) integrates environmental protection, environmental compliance, pollution prevention, and continual improvement into work planning and execution throughout the work areas as a part of the Integrated Safety Management System (ISMS). INL bases its EMS on elements identified in the EMS standard developed by the International Organization of Standards (i.e., ISO 14001) and integrates those elements into the core functions of integrated safety management. In 2014, INL recertified for the internationally recognized ISO-14001 EMS standard.

In addition to being integrated with EMS, the ISMS is integrated with other critical management processes at INL, including Integrated Safeguards and Security Management, the Worker Safety and Health Program, and the Voluntary Protection Program (VPP).

1.1 Voluntary Protection Program

INL's commitment to health and safety is demonstrated through its participation in DOE's VPP. VPP participants must model for other members of industry and DOE contractors a living, continuously improving program of safety excellence in management, employee involvement, worksite analysis, hazard prevention and control, and health and safety training.

In 2001, INL achieved VPP Star status, the highest of the program's three levels, for having an outstanding health and safety program. Star recognition indicates that the INL's health and safety program exceeds Occupational Safety and Health Administration requirements and DOE orders.

Since participating in VPP, INL has incorporated VPP into numerous safety processes, including safety leadership, employee safety teams, safety goals and objectives, safety roles and responsibilities, performance evaluations, work planning, subcontractor flow-down, self-assessments, inspections, occupational medicine, trending, training, and many more.

Sites (such as INL) that participate in VPP reap the following benefits:

- Injury and illness rates at VPP sites on average are 50% below industry norms
- Increased morale is exhibited as employees experience ownership of the program
- VPP sites are more competitive, with reduced compensation costs, absenteeism, and insurance premiums, in addition to improved labor management relationships

- Participants provide effective input to the Occupational Safety and Health Administration's standard-setting process with examples of proven ways to protect workers in their industries
- Continuous improvement is experienced through internal and external reviews that are part of the VPP process
- VPP sites gain positive community relations.

1.2 Comprehensive Environment, Safety, Health, and Quality Technical Disciplines

Because INL is hosting FORGE, INL's Environment, Safety, Health, and Quality (ESH&Q) Directorate staff of approximately 380 people is available to perform our ES&H activities. The staff of the ESH&Q Directorate is independent of research and development (R&D) organizations at INL, yet the staff is committed to providing the R&D community with cost-effective and timely solutions to ES&H challenges.

The following is a partial list of ESH&Q's technical disciplines available to support FORGE, as needed:

- Industrial hygiene
- National Environmental Policy Act (NEPA)
- Biological/ecological sciences
- Cultural resources/anthropology
- Clean Air Act/Clean Water Act
- Industrial safety
- Fire protection
- Safety engineering
- Occupational medicine
- Emergency preparedness
- Performance assurance
- Quality engineering
- Instrument and calibration
- Health physics
- Radiological control
- Nuclear safety analysis
- Environmental regulatory compliance
- Training coordination
- High-pressure/high-temperature systems

For more than 70 years, INL has conducted exceptional research and operations—often in highly challenging environments. These undertakings have repeatedly demonstrated a priority for safe operations and the health of the employees. FORGE operations, while challenging, will not set precedence in terms of difficulty operationally or from an ESH&Q standpoint. INL ESH&Q professionals have assisted in facility construction and subsequent research operations encompassing nearly all planned FORGE activities, including:

- Water-, injection-, and monitoring-well drilling and completion
- Geothermal-well drilling, completion, and stimulation
- Geothermal R&D plant construction and operation
- Geotechnical research (geophysical surveys, drilling, coring, and mapping)
- Bioenergy and biofuels research
- Renewable energy research (solar, wind, and hydropower)
- Nuclear reactor construction and operations
- Nuclear fuel storage
- Archaeology site identification, evaluation, and protection
- Mixed hazardous waste generation and disposition
- Battery research
- Chemistry laboratory work.

2. ENVIRONMENTAL, HEALTH, AND SAFETY RISKS

2.1 Environmental Protection and National Environmental Policy Act Compliance

As the FORGE host facility, INL possesses ES&H processes and procedures that have withstood the test of repeated implementation over many years. This includes numerous significant programs and projects similar in magnitude to FORGE. These processes and procedures are tailored to deliver cost-effective ES&H protective measures and enhance the implementation of site characterization, construction, and R&D measures.

FORGE operations will be preceded by activities required by (and subsequently will be conducted in compliance with) NEPA (42 U.S.C. §§4321-4370h). These activities include a DOE environmental assessment (EA) pursuant to a 10 CFR 1021, Subpart D, Typical Classes of Actions, level of NEPA review (a)(2). The draft environmental checklist (EC) prepared for FORGE activities, including Phase 2 characterization and Phase 3 enhanced geothermal systems activities, identifies potential environmental aspects or impacts. The EC (Appendix A) contains a detailed project work activity table that addresses the likely environmental requirements associated with probable Phase 2 characterization and construction and Phase 3 R&D activities. The EC has been put through a mock routing process to identify any potential challenges. Preparation and review included SRGC technical staff, INL facility management, INL environmental subject matter experts (SMEs), the DOE technical manager and the DOE NEPA compliance officer.

Consisting of approximately 2 hectares (5 acres) of soil disturbance, the FORGE operations pad is the primary driver for developing an EA. FORGE planning, permitting, and operations will capture and implement the environmental aspects identified in the EC, EA, and any decision issued by DOE.

The FORGE *Environmental Information Synopsis* (Irving and Podgorney, 2016) and *Research and Development Implementation Plan* (Podgorney et al., 2016) acknowledge NEPA compliance and underlying regulatory requirements, including those related to well permitting, groundwater production wells, monitoring wells, soil disturbances, and associated cultural resource surveys.

The SRGC has all of the disciplines needed to conduct a full evaluation for siting, constructing, operating, and maintaining FORGE. Our personnel include reservoir and drilling engineers; geologists; seismologists; wildlife, plant, air, and water scientists; cultural resource specialists; and waste management experts. INL has the proven ability to conduct its own environmental evaluations pursuant to NEPA.

2.2 Graded Approach to Work Control Development and Implementation

Research activities undertaken at INL are guided by laboratory procedures at appropriate levels of rigor. INL Laboratory-Wide Procedure (LWP)-20000, “Conduct of Research,” governs research within the INL Energy and Environment Science and Technology (EES&T) Directorate, including personnel from the EES&T Directorate who will lead the FORGE activities. LWP-20000 applies to personnel who request, perform, supervise, or manage activities or products. These include products delivered internally or externally to INL in support of R&D for programs, projects, and facilities in a laboratory, experimental space, or field location.

The EES&T Directorate uses a graded approach in the work control preparation process. Relevant levels of risk management and review, as well as the appropriate form of work control at FORGE, will be:

- Very low risk – routine activity envelope
- Low risk – performer-controlled activity

- Greater than low risk – laboratory instruction (LI) or Center for Advanced Energy Studies (CAES) project plan (CAES is the base of SRGC operations in Idaho Falls, Idaho).

Simple, routine activities (such as use of small hand tools) will be bound by the routine activity envelope designation and will require essentially no work control documentation. A performer controlled activity could be exemplified by a highly trained researcher examining a geologic sample on a specialized piece of analytical equipment that he or she has the proven ability to operate safely and competently. A performer-controlled activity form indicates the specific instrument or piece of research equipment and identifies by name the researchers who are determined by their management to be competent to operate the instrument or equipment. Research activities that pose moderate to high ES&H or programmatic risk warrant the development and implementation of an LI or CAES project plan. Section 2.2.1 outlines the content and process of LI development and implementation. A similar process is used in developing a CAES project plan.

2.2.1 Laboratory Instruction – Hazard Communication and ES&H Training

R&D activities at FORGE will be conducted primarily per INL LI or CAES project plans. The LI or CAES project plan work control development process is used to define the scope of the work, communicate and analyze the hazards, mitigate the hazards, and demonstrate that the activities can be performed within regulatory and facility limits. LIs and project plans for work conducted at CAES are reserved for research activities with greater-than-low-level risks and hazards. LIs and CAES project plans are prepared by the principal researcher. Most are already developed; those still required will be created before Phase 3 of the FORGE project begins.

An LI has the following sections tailored to the research activities to be conducted:

1. Purpose/Scope/Applicability—Research Activity Description (provide a description that includes the following):
   (a) Activity Location by Area, Building Number, and Laboratory Room Number
   (b) Activity Principal Researcher
   (c) Program Objectives
   (d) Project/activity Description
   (e) Major Equipment Used in the Activity
   (f) Quality Requirements
2. Risks and Controls
   (a) Risks and Controls
   (b) Performance Controlled Activity Lists
   (c) Hazard Scenarios that Require Mitigation
   (d) Waste Generation
   (e) Training Required
   (f) Lessons Learned
3. Prerequisites
   (a) Additional LIs Supporting this LI
   (b) Collocated Research Activities for this LI
4. Facility Conditions
5. Instructions

6. Post-Performance Activities
7. Abnormal Operations
8. Records
9. References
10. Appendixes.

Technical training needs related to ES&H and tasks are described in the "Training Required" section of an LI. Training records discussed in the Records section of an LI complement the depth and breadth of professional training that all FORGE EES&T personnel complete.

2.2.2 Hazard Identification and Mitigation

A key part of the LI is the Risks and Controls table. This table lists individual tasks, the hazards associated with performing each task, and the controls to mitigate the hazards. Hazards are identified through detailed work scope analysis and review by SMEs. The controls are divided into engineering, administrative, and personal protective equipment (PPE) categories.

Engineering controls are the first and preferred line of defense between a researcher and a hazard; they are the safest controls for the researcher if the hazard cannot be mitigated via substitution or elimination. Engineering controls are physical barriers that separate a researcher from a hazard. These may include items such as fume hood sashes, locked doors, blast shields, and equipment guards. Engineering controls are the most effective and preferred means of hazard mitigation.

In the absence of (or in addition to) suitable engineering controls, administrative controls are used and discussed in the LI. These are controls that are dependent on researcher diligence to execute. These can include controls such as procedures, training, limiting quantities of materials or chemicals, and use of vendor manuals.

PPE is considered the final line of defense between the researcher and a hazard; PPE is used to augment engineering and administrative controls or when adequate engineering and administrative controls are unavailable. Examples of PPE commonly used at INL are safety glasses with side shields, lab coats, gloves of various types, goggles, boots, and face shields.

We have in place a number of approved LIs and a CAES project plan that are suitable for immediate deployment during Phase 2 site characterization and Phase 3 R&D activities:

- LI 606, "Archeological Field Work"
- LI 1638-11-INL/Offsite, "Geophysical Seismic Surveys"
- LI 1639-11-INL/Offsite, "Geophysical Electromagnetic and Potential Field Surveys"
- LI 1640-11-INL/Offsite, "Monitoring Systems"
- LI 1641-11-INL/Offsite, "Geophysical Electrical Surveys"
- CAES – 030 Project Plan, "Geologic Field Sampling and Measurements."

We will develop other LIs during Phase 2 and define all potential hazards to the best of our abilities.

2.2.3 Executing Work – Approve, Authorize, Brief, and Release

We anticipate that, at any given time, multiple distinct and separate R&D activities may be under way at FORGE involving multiple field team leaders, principal researchers, and users. The specific team leads, principal researchers, and FORGE users would vary over time depending on the exact R&D activity undertaken. The field operations manager and the researcher community at large will be vigilant in assessing the potential for collocated hazards and operational conflicts in situations that involve multiple field activities occurring simultaneously.

As a means to establish readiness prior to performing work, the field operations manager, field team leaders, principal researchers, and users will ensure the R&D activity is approved, authorized, briefed, and released consistent with the ISMS guiding principle of "operations authorization" and research control procedures. The field operations manager, field team leaders (when applicable), principal researchers, and FORGE users will hold plan-of-the-day meetings, briefings, and job site walk-downs to verify the appropriateness of the work control, facility conditions, and worker training and fitness for duty. These activities will also be used to ascertain collocated hazards and operational conflicts.

FORGE researchers will be expected to have specific knowledge of the work being performed on assigned R&D projects, including the work scope, hazards, and expected mitigations. Researchers will have the responsibility to verify that the new scope has been reviewed and approved prior to conducting the activity. The researcher has the authority to take actions and, if necessary, stop work to ensure safe, secure, and environmentally compliant operations. The researcher also has the authority to maintain work activities within the approved safety envelope by communicating with the appropriate operational and organizational line management.

The field operations manager will use briefings to further determine readiness (people, paperwork, and process) before performing an activity. A briefing is an interactive discussion among the onsite FORGE staff, SMEs, and others, as appropriate, during which the activity scope, hazards, hazard mitigation, conditions, expectations, and any questions are addressed. These briefings, while thorough, do not have to be time-consuming.

Key aspects for the research staff to address in a briefing include:

- Competence of the researchers at the beginning of the project and when new or additional personnel are assigned to the project. Competence includes the researchers' training, qualifications, understanding, and fitness for duty.
- Critical steps (where incorrect execution may cause irreversible harm). The research staff will ensure critical steps are understood and human error is mitigated so that what must go right does go right.
- Any change-related drivers, such as new work, personnel, processes, or requirements, when there has been a significant lapse of time since an activity or task was last performed (i.e., months).
- Higher levels of risk. In this case, briefings must be documented and conducted by qualified briefers.

Job site walk-downs are valuable in all phases of an R&D activity (i.e., plan, execute, and complete). If a considerable amount of time has passed since the experimental system has been used, a walk-down of the system will be performed by the field operations manager, field team leader, FORGE staff involved with the work, and FORGE users. This walk-down will verify that the research system and field conditions are consistent with the "as-left conditions" and that the associated work control is appropriate.

3. FORGE ONSITE ORGANIZATION

The FORGE onsite operations organization has defined positions with specific roles and responsibilities, as summarized below (Figure 1). Construction and subcontracts are discussed in Section 5.

When either FORGE Phase 2 or 3 field activities are occurring, we will have appropriately trained, experienced, and authorized personnel on hand to ensure that FORGE subcontractors and staff, as well as the FORGE user community, fully implement the relevant ES&H aspects of the given work control, including LIs, CAES project plans, subcontractor requirements documents, NEPA documents, permits, and necessary notifications.

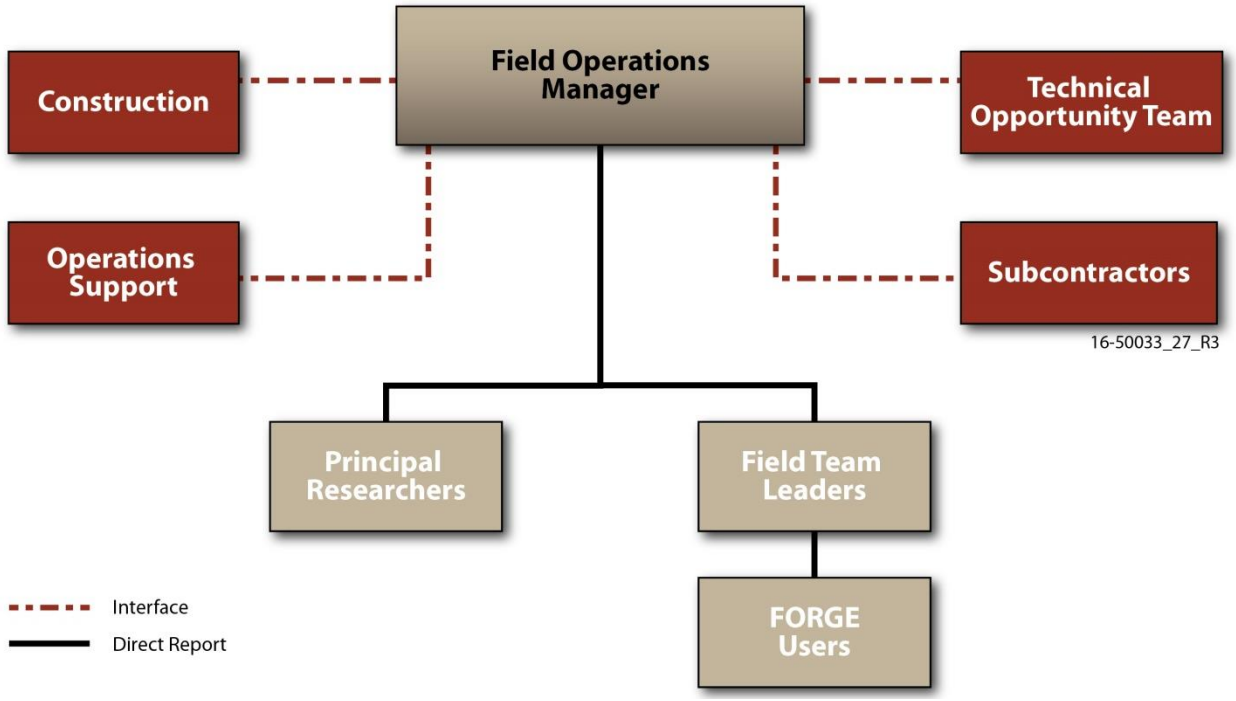

Figure 1. FORGE field operations management structure.

3.1.1 Field Operations Manager

The FORGE field operations manager, Paul J. Smith (in a dual role as the CAES operations manager), reports directly to the FORGE operations manager, Neil Snyder. The field operations manager is responsible for coordinating field activities and notifying the INL emergency-related organizations prior to initiating FORGE Phase 2 and 3 field activities, as detailed in Section 4. Under active field work conditions, the field operations manager will be supported by one or more field team leaders and/or principal researchers possessing appropriate ES&H training and authorities.

3.1.2 Field Team Leaders

Field team leaders supervise and direct activities and operations in the field. They conduct briefings on the specific work scope, hazards, and hazard mitigation prior to performance of the work. Field team leaders may perform field work, and they have required training and qualifications. In the event of an emergency or an abnormal event, field team leaders or principal researchers notify the field operations manager and emergency services (if not already notified), according to Section 4.

3.1.3 Principal Researchers

Principal researchers provide technical or scientific leadership to field team leaders and FORGE users for a suite of work. Principal researchers may or may not perform activities and operations in the laboratory or field locations. They may provide direction to users or may delegate this to field team leaders. In the event of an emergency or an abnormal event, principal researchers or field team leaders notify the field operations manager and emergency services (if not already notified), according to Section 4.

3.1.4 FORGE Users

FORGE users perform hands-on R&D activities and operations in the laboratory/field location. Users have specific knowledge of the work being performed—including the work scope, hazards, and expected hazard mitigation—and have required training and qualifications. FORGE users report to the field team leaders.

3.1.5 Technical Opportunity Team

The FORGE Technical Opportunity Team is tasked with planning and evaluation of technical projects proposed for FORGE. FORGE operations personnel are included on the team to ensure planned work activities are not only technically sound but can be performed in a safe and environmentally compliant manner. Proposed scope is evaluated against existing approved work control documents. If outside the approved ES&H boundaries, appropriate operations support personnel will be consulted to assist with a hazard analysis and mitigation, and work control documents will be modified.

3.1.6 Operations Support

Periodically, operational circumstances may dictate the need for onsite assistance by operations support personnel, including SMEs from industrial safety, industrial hygiene, environmental permitting, and electrical safety.

Additionally, when support from INL's ES&H organizations and individuals is needed, the FORGE field operations manager, in consultation with the operations manager, will initiate a request for ES&H services. The need for such support may be identified by the field operations manager, field team leaders, the FORGE users, or other individuals involved with planning and conducting work at the FORGE site. INL SMEs and related support services technical peers are, to a large extent, funded by INL's indirect funding mechanism to support projects and programs such as FORGE at little, if any, expense to the project. If the level of effort for a given support function becomes extensive, simple processes such as the task baseline agreement allow FORGE to quickly purchase an agreed upon service for a fixed, competitive price. The breadth of the INL's support services available, combined with competitive pricing and ease of securing these services ensures that FORGE technical needs are covered quickly and efficiently.

4. EMERGENCY PRECAUTIONS, RESPONSE, AND SERVICES

The INL Site setting necessitates that procedures for field work identify hazards and circumstances that may cause the field team to initiate an emergency response and evacuation. FORGE personnel working in the field will be trained to the LI relevant to the work planned and briefed such that they are aware of their ability and responsibility to use the INL Warning Communications Center (WCC) and INL Fire Alarm Center (FAC) as mechanisms to mobilize the INL's emergency response organizations. The WCC provides a single point of contact for collection and dissemination of emergency and non-emergency information and provides communications services to the DOE Idaho Operations Office and INL contractors.

Hazards that could trigger an emergency response and/or an evacuation of a FORGE personnel working in the field include operation of vehicles and potentially hazardous equipment in remote areas and difficult terrain (four-wheel-drive conditions); the presence of biological hazards (poisonous snakes, spiders, scorpions); overexertion, dehydration, and physical exhaustion; adverse weather (blizzards, high wind); range-land wild fires; and other situations that present imminent danger to personnel and equipment.

Prior to initiating FORGE Phase 2 and 3 field activities, the field operations manager or his designee will notify INL Personnel Security and the INL Central Facilities Area (CFA) FAC dispatcher of "Field Work

Visitation" by one of three methods—fax (526-6791), mail stop (4111), or telephone (526-2212)—and will coordinate field activities.

4.1 Field Access Authorization, Two-Way Communication, and Personnel Accountability

INL has developed INL-wide procedure LWP-14101, "Field Work." This document establishes guidelines for gaining approved field access, for equipment and communication needs, and for responsibilities of participating personnel.

We will implement LWP-14101 to ensure the safety and accountability of our onsite staff at all times. We will adhere to the guidelines for gaining authorized access to the field, equipment, and two-way communications needs, and, ultimately, the full accountability of personnel performing field work.

FORGE personnel performing field work within the INL Site boundary will complete the following simple activities before attempting to access the FORGE site:

- Complete online training for unescorted access
- Obtain an INL badge or INL visitor's access badge (requested through field operations manager)
- Complete all online job-specific training (LIs, CAES project plans, etc.)
- Notify the field operations manager.

The field operations manager will complete following prior to field work commencing:

- Ensure that the CFA emergency planner (526-2226) is informed of assigned field work points of contact and the methods used to communicate with workers at all times.
- Complete INL Form 150.04, "Idaho National Laboratory Field Work Visitation Form," and fax it to the INL FAC at 526-6791, OR assign an alternate point of contact who will have two-way communications at all times with all FORGE users in the field.

4.2 Reporting of Off-Normal or Emergency Conditions

Pursuant LWP-14101 and this plan, FORGE staff will report conditions that appear to present abnormal conditions or unanticipated hazards observed in the field to the following:

- Supervision (field operations manager, field team leaders, or the designated point of contact)
- WCC by calling 526-1515, radioing H INL OSC, or contacting the INL FAC (526-2212 or, in an emergency, 777 [cell 526-7777]).

4.3 INL Sitewide and Localized Emergency Evacuation and Response

In the event of an emergency or sitewide incident that may dictate evacuation of the FORGE site, such as an earthquake, a range-land wild fire, or a tornado, the FAC would call the field operations manager and/or other onsite personnel to provide evacuation guidance.

Range-land wild fires and severe weather occasionally occur on the INL Site, and the FAC is experienced in evacuating and guiding field research crews to safety during fires, as well as providing support from the INL Fire Department and Personnel Security, as needed. The proposed FORGE site has been impacted by a previous range fire and currently has very little "fuel" to sustain a fire.

In the case of emergency situations or threats to the local FORGE area, the onsite team would initiate emergency notification and response as necessary by communicating with the WCC at 526-1515, by radioing H INL OSC, or by contacting the INL FAC at 526-2212 or, in an emergency, 777 (cell 526-7777).

4.4 Emergency Services

4.4.1 Fire Department – Emergency Services

The INL Fire Department has a staff of approximately 100 assigned to three fire stations located on the 2,538-km^2 (980-mi^2) INL Site (Figure 2). The INL fire station nearest the FORGE site is approximately 11 km (7 mi) away via a highway. The three INL fire stations are fully manned 24 hours a day, 7 days a week, 365 days a year. In addition to professional firefighters, each station has fully trained emergency medical technicians (EMTs) on every shift. Each of the three engine companies and one ladder company onsite carries a full complement of equipment that is ready for immediate response to all potential rescue emergencies.

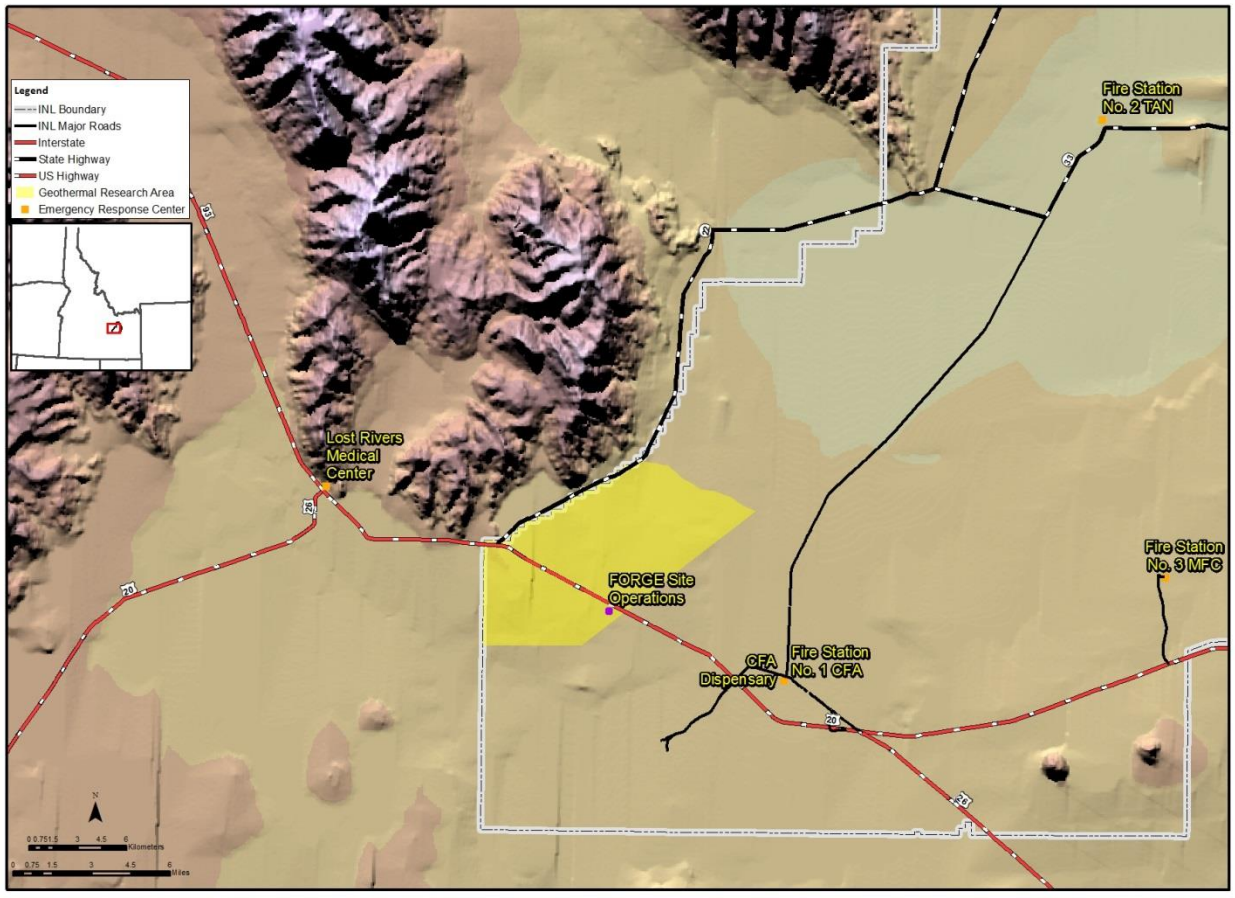

Figure 2. Fire stations at INL, dispensary at CFA, medical center in Arco, the FORGE site, and the roads that connect them.

Each INL facility area requires rescue services to be immediately available. To accommodate this need for services, all INL Fire Department personnel are certified in accordance with 29 CFR 1910.146, and equipment conforms to NFPA 1983, "Standard on Life Safety Rope and Equipment for Emergency Services."

Additionally, all INL Fire Department personnel are certified as Idaho State hazardous materials technicians. The initial response to all hazardous materials calls is one engine company augmented by a specialized hazardous materials response vehicle from Fire Station No. 1 at CFA. The INL hazardous materials response unit has all of the equipment necessary for hazardous materials identification, entry, mitigation, and decontamination. In addition to its ability to transport people and equipment, the unit has a mobile command and communications center for protracted emergencies.

All INL emergency dispatchers are certified through the National Academies of Emergency Dispatch as advanced emergency medical dispatchers and emergency fire dispatchers. Dispatchers provide the critical link between callers and emergency responders through accuracy, efficiency, and professionalism of caller interrogation. Dispatchers also prioritize the response and provide callers with life-saving instructions and support.

4.4.2 Medical Services – INL, Arco, and Idaho Falls

INL has significant onsite medical facilities and access to nearby major Level 1 intensive care emergency service. State and nationally registered EMTs operate four Type-3 ambulances in service at the INL Site. The INL Fire Department provides medical coverage at eight different facility areas at the INL Site and also supports the surrounding communities.

CFA Fire Station No. 1 and the CFA Dispensary are a 10-minute drive from the FORGE site (Figure 2). The INL Fire Department operates 24 hours a day, 7 days a week, offering fire and ambulance services. The ambulance responds to emergencies on the INL Site and on nearby highways, and INL has a good-neighbor agreement with the counties.

The CFA Dispensary is open 24 hours a day, 7 days a week, including holidays and weekends. The facility is fully staffed 10 hours a day, Monday through Thursday. After hours, during holidays, and on weekends, it is staffed by one nurse. Its primary function is providing occupational medical services to INL employees, but it has a full emergency room. The medical staff treats work-related injuries/illnesses, responds to cardiac events, and provides triage to allow transport of patients to a higher level of care when needed.

The nearest offsite medical facility to FORGE operations is the Lost Rivers Medical Center in Arco, Idaho (Figure 3). This facility is approximately 21 km (13 mi) via highway from the FORGE site and is located at 551 Highland Drive, Arco, Idaho 83213.

Lost Rivers Medical Center (see Figures 2 and 3) has an emergency room covered by physicians or nurse practitioners and a registered radiology technologist who are available 24 hours a day, 7 days a week. The center's physicians may consult with other experts around the region to ensure patients receive the correct diagnosis and treatment. The center works closely with Lost Rivers EMTs and South Custer Ambulance to provide the community around the INL Site with emergency care. Lost Rivers Medical Center also works closely with life-flight services and has a helipad for life-flight operations.

Eastern Idaho Regional Medical Center (EIRMC) is located in Idaho Falls, Idaho, approximately 93 km (58 mi) west of the FORGE site. EIRMC is home to one of Idaho's three Level II Trauma Centers, which are certified by the American College of Surgeons' Committee on Trauma, a distinction belonging to just over 150 of America's 5,000 hospitals. EIRMC is the first destination for trauma care in a 241-km (150-mi) radius of Idaho Falls. EIRMC is home to Air Idaho Rescue (AIR), a mini-fleet with a helicopter, a turboprop airplane, and ground transport capabilities. AIR is one of 136 nationally accredited air emergency transport services.

EIRMC has a Level 1 intensive care unit, a designation that means it can provide the highest level of intensive care for all cardiology, neurology, and trauma patients. Outside Idaho Falls, the nearest Level 1 critical care centers are in Salt Lake City, Utah; Boise, Idaho; and Missoula, Montana. The Emergency Department at EIRMC is a 30-bed unit with specialized rooms for trauma, cardiac, orthopedic,

obstetric/gynecologic, and ear, nose, and throat cases. The unit offers immediate access to CT (computed tomography) scanning and magnetic resonance imaging. Helicopter and airplane patient transport capabilities through AIR allow the EIRMC Emergency Department to serve emergency patients in an 805-km (500-mi) radius, helping to make it the busiest emergency department in the region, serving about 40,000 patients annually.

Figure 3. Lost Rivers Medical Center facilities (source: http://www.lostriversmedical.com/emergency-services).

4.4.3 Security/Protection

The 2,538-km^2 (980-mi^2) INL site is protected by a dedicated security protection force. Protection personnel patrol the interior and outer boundaries of the INL Site on a routine basis 24 hours a day, 7 days a week. In addition to INL security, the FORGE site is under the protection of the Butte County Sheriff's Department and the Idaho State Police. The FORGE site is within 1 km (0.6 mi) of U.S. Route 20. This highway is routinely patrolled by both police forces. Year-round access to this portion of the highway is maintained by the Idaho Department of Transportation.

Personnel working on INL property are required to wear badges issued by the Security Badging Office operated by Battelle Energy Alliance, the prime contractor at INL. Visitors are required to obtain visitor passes/badges and be escorted at all times while on the INL Site. However, once on the FORGE site, an escort is not necessary as long as the field operations manager (or a designee) is onsite.

5. ENVIRONMENTAL, SAFETY, AND HEALTH REQUIREMENTS FOR SUBCONTRACTORS

5.1 Construction Work Scope Subcontractors

FORGE construction activities will be performed by subcontractors through the INL procurement process. INL requires all subcontractors performing work on the INL-managed site to meet the INL ES&H requirements. Subcontractors have the option of adopting the INL requirements or providing their own ES&H plans. If the subcontractor chooses to provide its own ES&H plan, it must be approved by INL prior to award of the subcontract. INL performs a thorough review of each subcontractor's safety records prior to awarding subcontracts. The chain of events involved in obtaining services from a construction subcontractor includes the following steps:

- FORGE project personnel complete the design for the construction project
- The design package and scope of work (with ES&H requirements) are submitted for procurement
- Procurement issues a request for proposal and awards the contract
- An INL construction manager is assigned to manage the project cost, schedule, and execution with periodic oversight in the field
- An INL construction field representative is assigned for oversight in the field to ensure that work is completed per the contract and ES&H requirements are met.

Subcontracted activities carried out for FORGE may include the following:

- Site design
- Surveying
- Building a ~2 hectares (5-acre) operations pad
- Building a ~0.1 hectares (0.25-acre) pond
- Installing 480 VAC power
- Improving road access
- Lighting
- Fencing
- Temporary office trailers
- Water piping.

Figure 4 shows construction activities for each phase of the FORGE project.

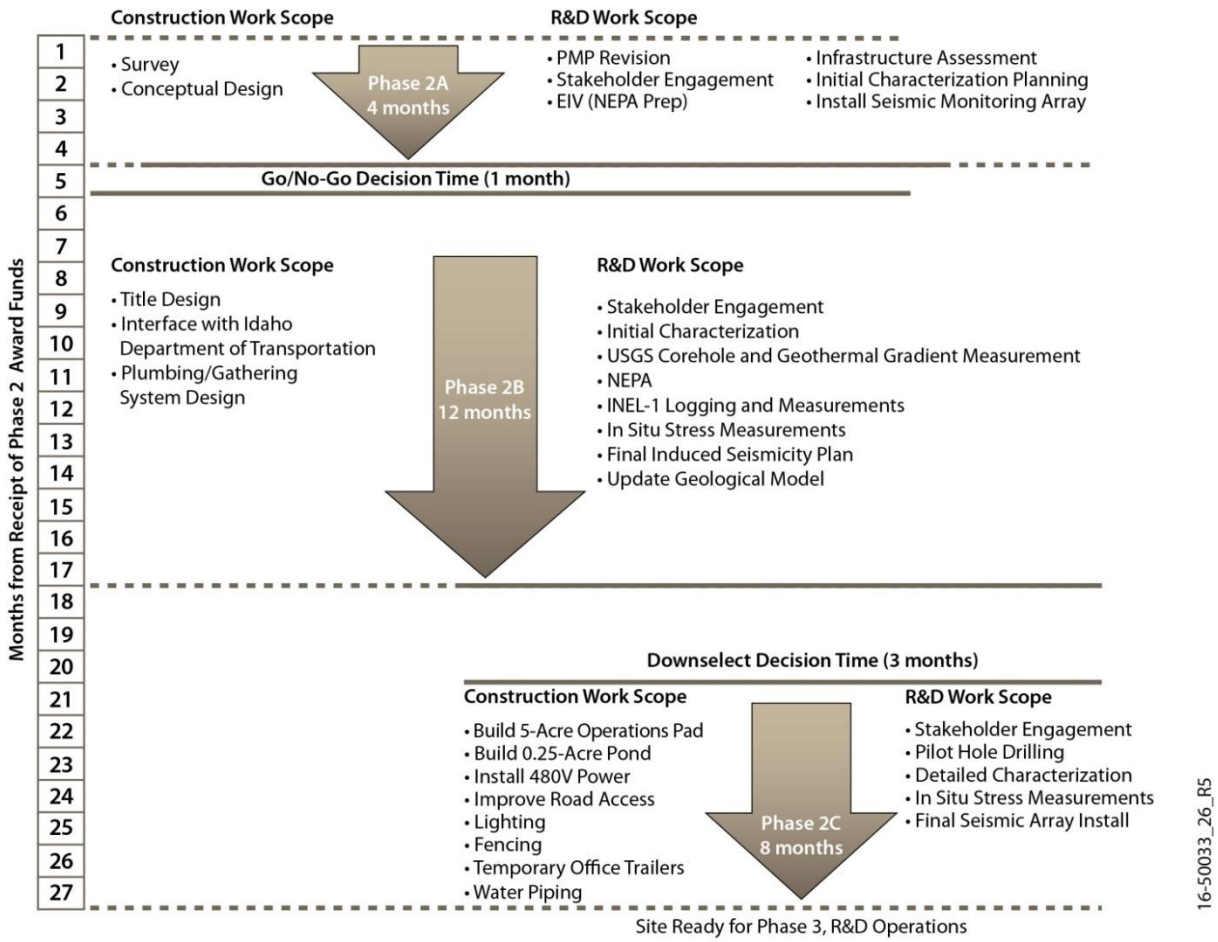

Figure 4. Work scope activities by phase.

5.2 Research and Development Work Scope Subcontractors

For the purpose of conducting certain field R&D activities, we will enter into subcontracts with vendors possessing unique skill sets. Work control requirements will be included in the contractual agreements to ensure adequate ES&H. This R&D field scope includes the following:

- Site characterization
- Geothermal well drilling
- In situ stress measurements
- Seismic monitor array installation
- Others as needed.

The R&D field scope vendors will be vetted for technical ability and an exemplary record of ES&H performance. Once on the FORGE site, these vendors will assume control of their specific work site and operations, implementing their organization's work control and ES&H processes. The field operations manager will monitor the vendor's performance for overall compliance with FORGE NEPA documents as well as permits and necessary notifications that may relate to the R&D vendor's scope of work.

Particular attention will be given to the drilling activities that pose unique safety risks. Drilling is included in the R&D work scope and will be performed through subcontracts. Procurement requirements will

include language to ensure the vendor's ES&H plan and performance reflect past drilling activities and are compatible with nationally accepted drilling safety programs. Other personnel onsite will be subject to the vendor's safety program during drilling operations.

6. SUMMARY

FORGE operations will be conducted on the INL Site and are thus subject to INL ES&H processes and procedures. A robust ES&H program is available through the INL and addresses all aspects of construction, research, operations, and subcontract work. A graded approach is used to apply the appropriate amount of rigor depending on the level of risk and hazards associated with the work tasks. Work performed through CAES has similar processes to ensure work is performed in a safe and environmentally compliant manner.

REFERENCES

10 CFR 1021, 2011, National Environmental Policy Act Implementing Procedures, Code of Federal Regulations.

29 CFR 1910, 2015, Occupational Safety and Health Standards, Code of Federal Regulations.

42 U.S.C. §§4321-4370h, 1970, National Environmental Policy Act.

CAES – 030 Project Plan, 2010, Geologic Field Sampling and Measurements, Rev. 4, Center for Advanced Energy Studies, 23 p.

Form 150.04, 2009, Idaho National Laboratory Field Work Visitation Form, Rev. 7, 2 p.

Irving, J.S., and R.K. Podgorney, 2016, Environmental Information Synopsis: Snake River Geothermal Consortium, INL/LTD-16-38126.

ISO 14001, 2015, Environmental management systems – Requirements with guidance for use, International Organization for Standardization, 35 p.

LI 606, 2013, Archaeology Field Work, Rev. 0, Idaho National Laboratory, 31 p.

LI 1638-11-INL/Offsite, 2015, Geophysical Seismic Surveys, Rev. 1, Idaho National Laboratory, 21 p.

LI 1639-11-INL/Offsite, 2015, Biophysical Electromagnetic and Potential Field Surveys, Rev. 3, Idaho National Laboratory, 28 p.

LI 1640-11-INL/Offsite, 2015, Monitoring Systems, Rev. 2, Idaho National Laboratory, 29 p.

LI 1641-11-INL/Offsite, 2015, Geophysical Electrical Surveys, Rev. 3, Idaho National Laboratory, 29 p.

LWP-14101, 2015, Field Work, Rev. 3, Idaho National Laboratory, 9 p.

LWP-20000, 2015, Conduct of Research, Rev. 1, Idaho National Laboratory, 82 p.

Metcalfe, E., 2015, Road Tripping through the Geothermal Frontier: http://energy.gov/eere/articles/road-tripping-through-geothermal-frontier (accessed March 2016).

NFPA 1983, 2012, Standard on Life Safety Rope and Equipment for Emergency Services: National Fire Protection Association, 56 p.

Podgorney, R.K., et al., 2016, Research and Development Implementation Plan: Snake River Geothermal Consortium, INL/LTD-16-38123.

Appendix A

FORGE Environmental Checklist

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EC Document No.: INL-16-039

DIRECTIONS:	Complete this form by completing Parts I through IV and by following the instructions as described at the beginning of each Part and Section, then submit the form to the National Environmental Policy Act (NEPA) Technical Lead or the appropriate Program Environmental Lead (PEL) or designee. See the Environmental Points of Contact, NEPA/Environmental Checklist (EC) Support at http://webfiles/es&h/es&s/contacts.pdf) for a list of PELs (or designee), Technical Points of Contact (TPOC), and the NEPA Technical Lead.
PART I -- Project / Program Manager or Principal Researcher:	Completes Section A (Descriptive Information or Contacts) and Section B (Project Description) and involve the appropriate PEL, as necessary.
PART II – Program Environmental Lead (or designee):	Completes Section C (Environmental Aspects) and Section D (Work Activities) and involve project personnel, as necessary.
PART III Program Environmental Lead (or designee):	Completes Section E (Potential Environmental Impacts, Conditions, and Project-specific Instructions) with help from Technical Points of Contact and the NEPA Technical Lead, as necessary.
PART IV ES&S Representative (the NEPA Technical Lead or appropriate PEL):	Completes Sections F and G (Level of Environmental Review and Approvals.

PART I:
Project / Program Manager or Principal Researcher identify the appropriate contacts (Section A), charge number, and prepare or attach a detailed project scope (Section B). If necessary, involve the PEL (or designee). Once complete, send this form to the appropriate PEL (or designee) to complete Part II (Sections C and D).

SECTION A. Descriptive Information: Enter project title, performing organization, project number, submittal date, and contact information (generally Department of Energy (DOE) and Idaho National Laboratory (INL) employees as requested below). Enter a charge number to prepare, review, and approve the EC.

Enter a Valid Charge Number: 530227A66

Project Title: Constructing and Operating an Enhanced Geothermal System (EGS) Field Laboratory on the Idaho National Laboratory
Mission Center: Energy and Environment Science and Technology
Performing Organization: Energy Systems and Technology — Project No.: N/A — Date: 1/27/2016

Contact	Name	Telephone No.	E-mail Address
DOE Project Technical Manager:	S. S. Twining	208-526-2540	twininss@id.doe.gov
Facility / Nuclear Facility Manager:	R. J. Bitsoi	208-526-7475	rod.bitsoi@inl.gov
Program / Project Manager or Principal Researcher:	Rob K. Podgorney	208-526-1524	robert.podgorney@inl.gov
Technical Contact or Principal Investigator:	N/A	N/A	N/A
Alternative Contact:	T. L. McLing	526-7269	travis.mcling@inl.gov
Environmental Field Support Contact:	Robert A. Montgomery	208-526-9339	robert.montgomery@inl.gov
Additional Contacts:			
NEPA / EMS	John S. Irving	208-526-8745	john.irving@inl.gov

⇩ **Go to Section B, "Project Description and Purpose"**

SECTION B. Project Description and Purpose: Describe thoroughly the project or action, including the type of action (for example, new activity or facility, construction, process or facility modification, maintenance, research and development, work for others), describe activities, work phases, and location in enough detail to determine the geographic extent of the project (e.g., facility area, building number, and longitude and latitude coordinates, and if in the field, include a map or diagram). Also, describe the purpose and need (what is the activity and why is the activity being performed), projected start and end dates, and the estimate project costs.

Enter Keywords: Geothermal | Wells | Field Laboratory

Enter Project Description (in sufficient detail to identify the purpose, activity, location, schedule, duration, and cost)**:**

Project Scope. The purpose of this proposed project is to develop an enhanced geothermal systems (EGS) field laboratory, known as the Frontier Observatory for Research in Geothermal Energy (FORGE). The EGS field laboratory would allow scientists and engineers to perform experiments, apply technologies, and develop innovations to target and harvest thermal energy from deep in the Eastern Snake River Plain (ESRP). Researchers would extract the thermal energy from the ESRP though specially designed boreholes that would penetrate more than 2.5 km (1.5 mi) into the hot volcanic rock. The proposed location is the Geothermal Resource Research Area (GRRA), an area of about 110 km^2 (42.6 mi^2) that INL has dedicated for geothermal research. The final location of the well pad site will be within the boundaries of GRRA along Highway 20/26 (see Figure 1).

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This document divides and describes site characterization and a construction and operations activity for the EGS field laboratory as follows:

- **Site Characterization.** Site characterization would include exploratory geotechnical borings and permitting activities during 2016 and 2017. Site characterization also includes performing field work to collect preliminary microseismic data, which entails setting up five to 10 temporary seismic monitoring stations and collecting detailed data over 4 months. The placement of these stations would result in some soil disturbance due to burying the sensors several feet to reduce noise in the dataset and possible damage from off-road vehicle travel.

  Characterization activities would largely include passive/remote data sensing, where access to the GRRA, and surrounding areas, would be necessary; however, soil and site disturbance would be minimal. Examples include collecting gravity, magnetotelluric, seismic, and resistivity data by walking or driving transects through the area and stopping intermittently to take readings from sensors. Surveying and mapping activities would likely occur to help design a well pad/operations area from the research.

  If possible, INL monitoring and exploration wells would be reentered and additional well logs completed to obtain information on subsurface characteristics. A number of U.S. Geological Survey wells are available in the area and would be targets for data collection. To collect additional geophysical, reservoir-hydraulics, and stress-state data, the project plans to explore a greater than 3,048-m (10,000-ft)-deep exploration well, INEL-1. Access will entail removing several plugs that were installed in the late 1990s.

  Following these initial characterization activities, project activities would include a full subsurface characterization to bring the site to a readiness status. Activities include:
  - Building or improving up to 0.8 km (0.5 mi) of single-lane gravel roads.
  - Constructing a well/operations pad that will be up to 40,468.6 m^2 (10 acres).
  - Installing a small substation for power needs at the site and constructing a water-holding pond to intermittently store operational waters.
  - Directionally drilling several deep geothermal test borings to depths ranging from 2.5 – 3.7 km (1.5 to 2.3 mi).
  - Drilling an industrial water supply well and up to 10 seismic monitoring wells (the groundwater and seismic wells will be between 243 – 366 m [700 to 1,200 ft]) deep.
  - Installing several temporary office trailers and a potential cellular signal boosting station, if needed.
  - Installing data-collection systems on all seismic monitoring wells and groundwater monitoring sensors on a number of INL groundwater wells. These instruments will use cellular modems or radios.

- **Establishing the Field Lab (Construction).** Construction activities include drilling additional geothermal and monitoring wells, installing water-handling pumps to inject water into or pump water from the geothermal wells, and installing piping between wells as necessary (on the operations pad).

- **Operation.** Operation activities include conducting reservoir stimulation experiments that will create fractures in the deep rocks using any number of potential methods, injecting fluids (e.g., injecting water under high pressure or hydraulic fracturing), energetic methods (e.g., small explosions), or deflagration methods (e.g., short bursts of very high gas pressures).

  Long-term operations will involve flowing water between two or more geothermal wells, pumping water to the surface, cooling water in a cooling tower, reinjecting water into the subsurface, and other energy-related research that uses the GRRA location and infrastructure.

- **Project Location.** All surface work would occur within the GRRA that INL has dedicated for geothermal research. The final location of the well pad site will occur within the boundaries GRRA along Highway 20/26 (see Figure 1). Subsurface work (directional drilling) may extend beyond the boundaries of the GRRA.

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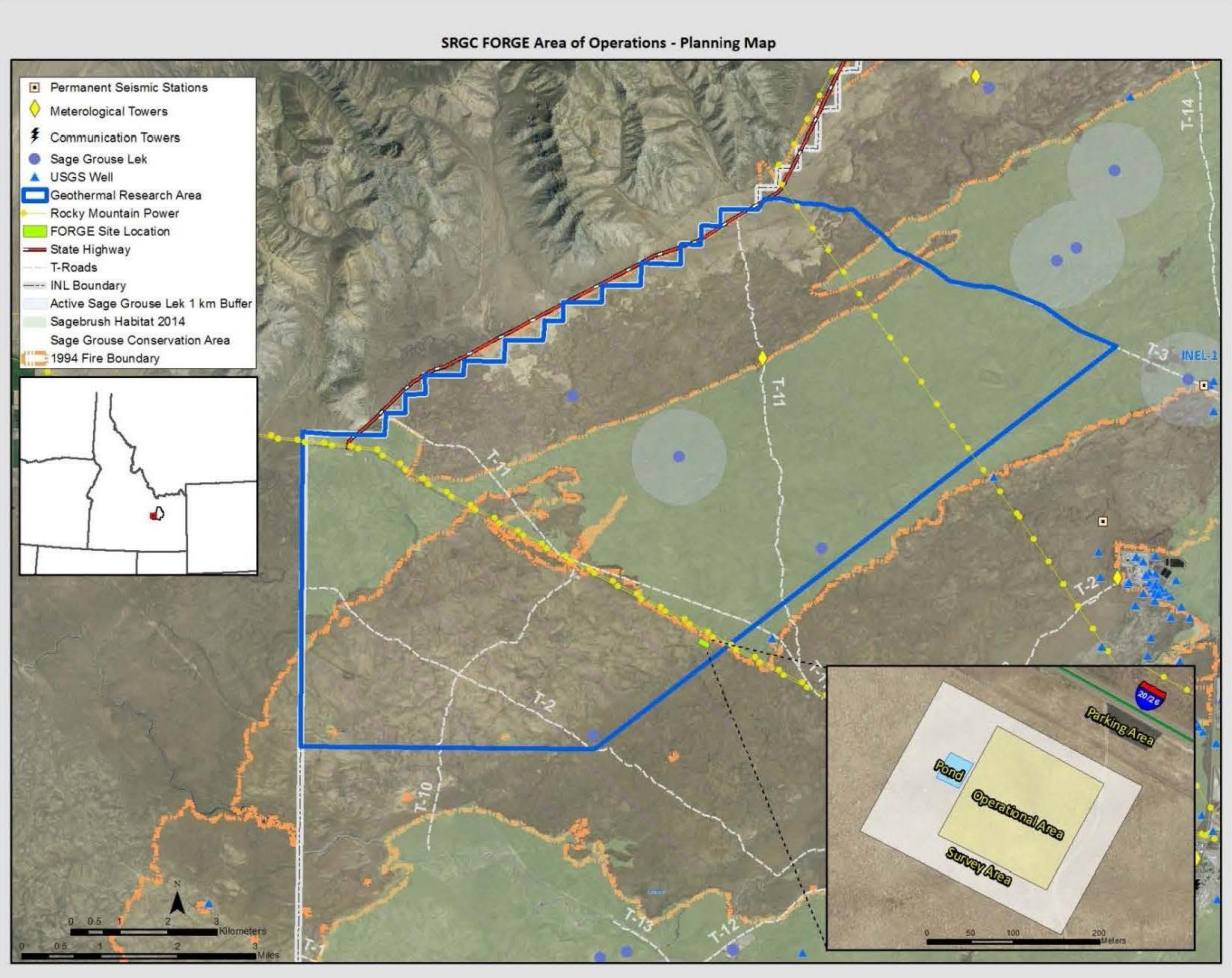

Figure 1. GRRA and site location on the INL Site in southeast Idaho.

The GRRA is located in an extremely dry area near the southern toe of the Lost River Range; this is an area of low topographic relief, covered by an alluvial fan originating at the toe of the Lost River Range. The alluvial fan is a thin (meters) sediment cover over the basalts of the ESRP extending to a depth of more than 1,000 m (3,280 ft).

⇩ **Send to PEL (or designee) to Complete Part II: Section C "Environmental Aspects or Potential Sources of Impact" and Section D "Work Activities and Environmental Checklist Determination"**

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PART II:
PEL (or designee) identify the environmental aspects (Section C) and work activities (Section D) based on the project scope. If necessary, involve project personnel, the NEPA Technical Lead, or specific TPOCs. Once Sections C and D are complete, the PEL (or designee) moves to Part III (Section E).

SECTION C. **Environmental Aspects or Potential Sources of Impact:** Check the applicable box for the following environmental aspects by reviewing the applicability statements. Ask yourself, "How can this activity affect the environment?"

Environmental Aspects Table			
Environmental Aspect	**Applicability Statement**	**Yes**	**No**
Air Emissions	Air emissions applies to operations or activities that have the potential to generate air pollutants, including but not limited to radionuclides, chemical and combustion emissions, fugitive dust, and ozone-depleting substances. Includes activities that may break up, dislodge, disturb or block access to regulated asbestos-containing material (RACM), handle asbestos-containing material, manage asbestos waste, or demolishing a load bearing structural members, (including trailers).	☒	☐
Discharging to Surface-, Storm-, or Ground Water	Discharging to surface water, storm water, or ground water applies to activities that have the potential to contaminate waters of the U.S. or ground water	☒	☐
Disturbing Cultural or Biological Resources	Cultural resource disturbance applies to activities that have the potential to impact cultural resources, such as disturbing soils by grading, excavating, sampling, off-road vehicle use, or removing vegetation and to project activities in areas where sensitive cultural or biological resources are located. The aspect also applies to modifying or demolishing historical buildings or structures, or activities that could result in loss or damage to these resources. Examples of cultural resources include buildings, structures, or objects over 50 years old or those identified as historic because of special significance, Experimental Breeder Reactor (EBR-I), archaeological resources, historic home sites, trails, and canals, caves, and places or items of significance to Native Americans and others. Biological resources applies to activities that have potential to interact, disturb or affect wildlife or their habitat (e.g., soil disturbance – including the areas below the ordinary high water mark, vegetation removal, physical disturbance of wildlife) or activities involving revegetation or weed control.	☒	☐
Generating and Managing Waste	Regulated, hazardous, or radioactive material and waste packaging and transportation applies to activities that generate, store, treat, or dispose hazardous, radioactive, mixed, industrial waste, or nanoparticle waste.	☒	☐
Releasing Contaminants	Releasing contaminants applies to activities that may release potentially hazardous contaminants into water, soil, or other non-contaminated or previously contaminated locations (NOTE: the "Air Emissions" aspect covers air contaminants, see above). These activities may include, but are not limited to, the use of industrial and laboratory chemicals; the use of radionuclides; hazardous, radioactive, and mixed waste treatment and decontamination operations; and contaminated soils disturbance. This aspect also applies to asbestos containing material (ACM) remediation; repair, replacement, and disposal of contaminated tanks and associated piping; and the handling and disposal of PCB-contaminated equipment and waste.	☒	☐
Using, Reusing, and Conserving Natural Resources	Using, reusing, and recycling of resources applies to activities that use or recycle resources such as water, energy, fuels, minerals, borrow material, wood or paper products, and other materials derived from natural resources. This aspect also applies to activities that currently require use, reuse, and recycle as integral to the project such as constructing and operating a LEED certified building. This applies to waste disposition activities including building demolition and activities implementing sustainable practices and conserving of natural resources.	☒	☐

⇩ **Go to Section D, "Work Activities and Environmental Checklist Submittal Determination"**

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SECTION D. **Work Activities and Environmental Checklist Determination:** Select all of the applicable work activities below. Section numbers refer to section in LWP-8000 Environmental Instructions for Facilities, Processes, Materials, and Equipment. The numbers (e.g., 4.35) refer to LWP-8000 Section numbers and when highlighted or shaded, projects with those activities, require submittal of the EC to Environmental Support and Services (ES&S) using the instructions in the direction at the beginning of this form.

☒ Required to submit the EC to the appropriate PEL or the NEPA Technical Lead (see Points of Contact, Environmental Management System at http://webfiles/es&h/es&s/contacts.pdf)

☐ Not required to submit EC (see instructions in LWP-8000, Section 4.1).

Work Activity Table		
The work activity will involve (check all appropriate boxes):		LWP-8000 Section No.
1. Boilers, diesel generators, painting booths, vehicle fleet, gasoline pumps, nonroad power take offs, laboratory hoods, containments, glove boxes, treating spent nuclear fuel (SNF), nuclear reactor, fuel fabrication, open burning, generate fugitive dust, and other activities that could emit air pollutants?		
	☐ Activities that have the potential to approach or exceed permitted or regulatory limits for air emissions	4.33
	☐ Conducting open burning	4.35
	☒ Constructing, reconstructing, or modifying stationary air emission sources, including internal combustion engines	4.29
	☐ Distributing, excessing, or disposing of appliances containing refrigerants	4.45
	☐ Maintaining, servicing, or repairing motor vehicle air conditioners (MVAC)	4.44
	☐ Maintaining, servicing, or repairing stationary heating, ventilation, air conditioning and refrigeration equipment	4.43
	☐ Maintaining, testing, or disposing of halon-containing equipment and halon	4.38
	☐ Manufacturing wood furniture and wood furniture components	4.21
	☒ Operating and maintaining stationary air emission sources, including internal combustion engines	4.31
	☐ Operating stationary air emission sources that emit radionuclides	4.32
	☒ Performing activities with the potential for fugitive dust or fugitive emissions	4.34
	☒ Purchasing diesel fuel	4.36
	☐ Purchasing equipment containing ozone-depleting substances (ODS), such as refrigerants or halon, or recovery or recycling equipment with ODS	4.42
	☒ Purchasing, relocating operating, modifying, or maintaining portable air emission sources, including non-road internal combustion engines, for use at the Site or Idaho Falls facilities	4.28
	☐ Receiving off-site waste containing one or more of the hazardous air pollutants	4.107
	☐ Starting up, shutting down, or performing scheduled maintenance on stationary air emissions sources	4.30
2. Pesticides, fertilizers, spills or releases, disposing excess materials, perform site remediation, chemical use or storage, shipping, managing, or removing lead, or other activities that could release contaminants?		
	☒ Acquiring, using, storing, and dispositioning chemical	4.5
	☐ Applying and storing pesticides	4.46
	☒ Applying fertilizers	4.47
	☒ Managing and dispositioning excess property and materials	4.80
	☐ Managing Invasive Species on the INL	4.126
	☒ Managing Noxious Weeds on the INL	4.125
	☒ Procuring pesticides	4.111
	Activities that have the potential to approach or exceed permitted or regulatory limits for:	
	☐ Air emissions	4.33
	☐ Drinking water	4.13
	☐ Wastewater discharges to the City of Idaho Falls sewer system	4.85
	Spills and releases	
	☐ Cleaning up spills and releases of polychlorinated biphenyls (PCBs) (From equipment manufactured before 1982)	4.59
	☐ Releases, leaks, spills, or unusual operating condition from USTs regulated under IDAPA 58.01.07 (40 CFR 280)	4.68
	☒ Reporting and cleaning up spills and releases	4.58
	Managing, removing, or shipping lead	
	☐ Managing elemental lead	4.40
	☐ Removing lead from service or from a structure, or classifying newly discovered lead	4.39
	☐ Shipping product lead off-site for direct reuse (that is, no reclamation) at another facility	4.41
3. Siting studies, transacting real property and excess real property, site remediation, reactivating buildings or placing buildings in standby, modifying historic buildings or structures, vehicles fleet, paved and unpaved road (or two-track roads), diversion dams, stream channels, disturbing soils, gravel or borrow pits, wildland fires, field work, or constructing, modifying, maintaining, operating, or DD&D facilities, structures, equipment, or processes?		
	☒ Constructing or Modifying Facilities, Structures, Equipment, or Processes (including changes to operating conditions – General	4.15
	☒ Deactivating, Decontaminating, Dismantling (DD&D), or closing facilities (including trailers), structures, equipment, or processes – General	4.27

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☒	Maintaining or repairing facilities, structures, equipment, or processes – General	4.19
☐	Managing and using gravel pits/borrow sources on the INL	4.127
☒	Managing migratory birds and bird nests on the INL	4.128
☐	Modifying EBR-I or any buildings or structures constructed on the INL before 1970 (Note: The focus of this work activity is on buildings or structures constructed on the INL before 1970 because they are potentially eligible for nomination to the National Register of Historic Places (NRHP))	4.116
☒	Operating facilities, equipment, or processes – General	4.17
☐	Performing site remediation activities	4.114
☒	Performing siting studies for new buildings or structures	4.14
☐	Preparing buildings or facilities being transferred to surplus or placed into standby (inactive) status	4.25
☐	Reactivating buildings or facilities from standby (inactive) status	4.26
☒	Removing or disturbing native or naturalized vegetation, disturbing soil, or working within the Sagebrush Steppe Reserve, Sage-Grouse Conservation Area, CITRC fenced boundary, the area between SMC and TAN, or in the INL storm water corridor	4.117
☒	Revegetating/Rehabilitating Activities on the INL	4.124
☒	Transacting Real Property – including transfer, lease, disposition, or acquisition of interests in personal property (including, but not limited to, equipment and materials) or real property (including, but not limited to, permanent structures and land)	4.49
4. Potable (or drinking) water including controlling cross connections and altering drinking water systems or potable water, production, monitoring, observation, or injection wells?		
	Constructing, operating, or decommissioning or abandoning wells	
☒	Constructing or modifying injection wells	4.94
☒	Constructing or modifying potable water, production, monitoring, and observation wells	4.91
☒	Decommissioning (or abandoning) potable water, production, monitoring, and observation wells	4.93
☒	Operating potable water, production, monitoring, and observation wells	4.92
☐	Operating and sampling drinking water systems and controlling cross connections at the Site	4.10
☒	Operating, discharging to, or monitoring permitted injection wells	4.95
☒	Permanently decommissioning injection wells	4.97
	Constructing or modifying, maintaining or repairing, operating, or using drinking water systems	
☐	Constructing or modifying drinking water systems (including associated wells) and controlling cross connections at the Site	4.9
☐	Constructing or Modifying Drinking Water Systems and Injection Wells (including Associated Wells) and Controlling Cross Connections at INL Owned REC Facilities, including Leased Facilities	4.108
☐	Maintaining, repairing, or altering drinking water systems (including associated wells) and controlling cross connections at the Site	4.12
☐	Maintaining or Repairing Drinking Water Systems (including Associated Wells) and Controlling Cross Connections at INL Owned REC Facilities, including Leased Facilities	4.109
☐	Using drinking water systems and controlling cross connections at the Site	4.11
☐	Using Drinking Water Systems and Controlling Cross Connections at INL Owned REC Facilities, including Leased Facilities	4.110
☐	Activities that have the potential to approach or exceed permitted or regulatory limits for drinking water	4.13
5. Research and development (R&D) or training activities or work for other activities that involve working in a laboratory or in the field, including small-scale pilot and demonstration projects and explosive testing?		
☒	Conducting New or Modifying Research and Development Activities, Including Indoor Bench-Scale and Small-Scale Research and Development Activities, and Small-Scale Pilot Projects (includes, but not limited to indoor and outdoor training at firing ranges and elsewhere onsite).	4.50
☐	Training Exercises and Simulations Related to Protective Force and Emergency Response Training, Fire Fighting and Rescue Training, and Spill Cleanup Training on the INL Site and in Town (includes but not limited to indoor and outdoor training at firing ranges and elsewhere on site)	4.115
☐	Importing biomass to the State of Idaho	4.123
☐	Managing and disposing of unbound engineered nanoparticle waste	4.119
6. Preparing, collecting, packaging, storing, transferring, or disposing samples or obtaining laboratory services?		
☒	Disposing of samples	4.105
☒	Packaging and temporarily storing samples	4.102
☐	Preparing to collect and collecting CERCLA or DD&D samples	4.98
☒	Preparing to collect and collecting Non-CERCLA or Non-DD&D samples	4.100
☒	Storing and maintaining samples	4.104
☒	Transferring samples to a laboratory	4.103
7. Aboveground storage tanks (ASTs) or underground storage tanks (USTs) or containers?		
☐	Changing use, discontinuing use of, closing, relocating, or removing ASTs or USTs not regulated under IDAPA 58.01.07 (40 CFR 280)	4.64
☐	Constructing or modifying ASTs and USTs not regulated under IDAPA 58.01.07 (40 CFR 280)	4.60
☒	Constructing or modifying facilities that store oil in containers or tanks	4.7
☐	Constructing or modifying UST systems regulated under IDAPA 58.01.07 (40 CFR 280)	4.65

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☐	Operating ASTs or USTs not regulated under IDAPA 58.01.07 (40 CFR 280)	4.61
☐	Operating USTs regulated under IDAPA 58.01.07 (40 CFR 280)	4.66
☒	Operating stationary, portable, or mobile oil tanks and oil container storage facilities	4.8
☐	Repairing ASTs or USTs not regulated under IDAPA 58.01.07 (40 CFR 280) (also check 4.19)	4.62
☐	Temporarily Closing, change-in-service, permanently discontinuing use, closing, relocating, or removing USTs regulated under IDAPA 58.01.07 (40 CFR 280)	4.71
☐	Releases, leaks, spills, or unusual operating condition from USTs regulated under IDAPA 58.01.07 (40 CFR 280) (If spill or release, also check 4.79)	4.68
☐	Repairing USTs regulated under IDAPA 58.01.07 (40 CFR 280) (Also check 4.19)	4.67
8. Preparing to generate or generating a waste (hazardous, industrial, mixed, and radioactive)?		
☐	Constructing or modifying facilities, equipment, or processes at permitted or interim status Resource Conservation Recovery Act (RCRA) facilities	4.73
☐	Decontaminating equipment containing or contaminated with polychlorinated biphenyls (PCBs) (From equipment manufactured before 1982)	4.24
☐	Discontinuing use of, or closing facilities, equipment, or processes at Resource Conservation and Recovery Act (RCRA) interim status or permitted facilities	4.75
☐	Disposing of asbestos-containing material	4.112
☐	Disturbing asbestos, removing asbestos-containing material (ACM), or conducting a demolition activity	4.3
☒	Generating waste	4.79
☐	Generator treatment of hazardous waste	4.118
☐	Maintaining equipment containing or contaminated with polychlorinated biphenyls (PCBs) (From equipment manufactured before 1982)	4.23
☐	Procuring off-site waste management and Resource Conservation and Recovery Act (RCRA)-regulated material recycling services	4.77
9. Septic or sewage systems, wastewater, effluents, or storm water?		
☐	Abandoning or closing septic tanks or systems	4.56
☐	Activities that have the potential to approach or exceed permitted or regulatory limits for Wastewater Discharges to the City of Idaho Falls Sewer System	4.85
☐	Constructing or modifying septic tanks or systems	4.52
☐	Constructing or modifying sewage and other reuse systems at the INL Site	4.81
☐	Discharging to septic tanks or other wastewater systems	4.53
☒	Discharging Wastewaters at the INL Site	4.87
☐	Discharging Wastewaters to the City of Idaho Falls Sewer System	4.83
☐	Operating wastewater systems, including reclamation or reuse facilities	4.89
☐	Maintaining or repairing septic tanks or septic systems	4.54
☐	Managing Storm Water Discharges at INL Owned REC Facilities, including Leased Facilities and at the INL Site	4.120
☐	Monitoring wastewater discharges to the city of Idaho Falls Sewer System	4.84
☐	Pumping septic tanks or septic systems	4.55
10. Incorporating Sustainability and National Environmental Policy Act Compliance?		
☐	Office work and routine administrative activities and work-for-other activities that do not involve working in a laboratory or in the field	4.51
☐	Supporting Site Sustainability Plan goals at INL; does your work involve: ☒ Greenhouse Gases - (burning fossil fuels, operating vehicle fleet, purchasing electricity, business travel, etc.) ☐ Building Energy Use ☒ Renewable Energy Generation or Consumption ☐ Fleet Petroleum or Alternative Fuels Use ☐ Potable, Industrial, or Irrigation Water Consumption ☐ Storm Water Management ☐ Landfill Waste or Construction and Demolition Wastes ☒ Any Recyclable Materials ☐ New Building Construction over 5,000 gross ft² ☐ Any Building Entering the Planning Process after FY 2020 ☐ Engaging in Sustainable Acquisition Practices at INL	4.121

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	☐ Compliance with the National Environmental Policy Act (Work involves the following facilities, actions, or processes): ☐ Replacement Capability for Disposal of Remote-Handled Low-Level Radioactive Waste Generated at the Department of Energy's Idaho Site (DOE/EA-1793 and Plan-4089) ☐ Multipurpose Haul Road (DOE/EA-1772) ☐ Stand-Off Experiment (SOX) Range (DOE/EA-1822 and INL-11-029) ☐ Radiological Response Training Range (DOE/EA-1776 and INL-10-077) ☐ Research and Education Campus (DOE/EA-1555) ☐ National Security Test Range (DOE/EA-1557) ☐ Sagebrush Steppe Ecosystem Reserve (EA ID-074-02-067) ☐ Wildland Fires Pre-Fire, Suppression, and Post-Fire Activities (DOE/EA-1372) ☐ Silt or Clay Borrow Sources (DOE/EA-1083) ☐ Resumption of Transient Testing of Nuclear Fuels and Materials (DOE/EA-1954 and Plan-4687) **NOTE**: *Go to INL's Electronic Document Management System (EDMS) to view copies of the above EAs, Plans, and ECs.*	4.122

⇩ **Once Sections C and D are complete, move to Part III (Section E "Describe Potential Impacts, Conditions, and Project-Specific Instructions")**

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PART III:
PEL (or designee): Completes Section E (Potential Environmental Impacts, Project Conditions, and Project-specific Instructions) with help from Technical Points of Contact and the NEPA Technical Lead, as necessary. Once Section E is complete send this form to the ES&S Representative (the NEPA Technical Lead) if a 1st Tier EC or the appropriate PEL (or designee) if this is a 2nd Tier EC to complete Part IV (Sections F and G).

SECTION E. **Describe Potential Impacts, Conditions, and Project-Specific Instructions:** For each environmental aspect checked 'Yes' in Section C, include a description of the potential impacts to the environment. In addition, describe any **conditions** that project personnel must complete or have approved before project activities (such as cultural resource or biological resource clearances, air permitting applicability determinations, permits to construct, waste permits, sustainability opportunities and so forth)? Also, describe any **project-specific instructions** that INL must complete during or at the end of the project. Be specific when describing conditions and project-specific instructions (e.g., identify who is responsible, what must be done and when, and what must be done with any information).

Describe Potential Environmental Impacts (Enter N/A for those that do not apply or where you checked 'No' in Section C 'Environmental Aspects):

A more detailed analysis of potential environmental impacts from the proposed action will occur during later phases of the FORGE selection process. This document recommends that DOE prepare an environmental assessment (EA) as the appropriate level of environmental review (see Section F). In general, project activities will generate waste; release effluents to the air, water, and soil; and disturb natural, biological, and cultural resources during construction and operations activities. The following sections describe the potential environmental impacts of the proposed project activities.

Biological Resources - The proposed project area encompasses areas of mostly native vegetation that are home to numerous animals and plants, including livestock that graze this area. The natural vegetation on the INL Site consists of a shrub overstory with a grass and forbs understory. The most common shrub is Wyoming big sagebrush, where basin big sage may dominate or co-dominate in areas with deep or sandy soils. No species that occur at INL are listed as endangered or threatened, but several are species of concern or candidate species. However, wildland fires in 1994 and 2000 reduced sagebrush stands within the project area, allowing more flexibility in siting project wells and facilities while minimizing the effect on sage-grouse habitat.

Potential environmental impacts include disturbance (or removal) of native vegetation during construction activities and disturbance of wildlife during operations activities. Concerns related to potential adverse impacts include the potential (or risk) of wildland fire, loss of sagebrush (and species that depend on sagebrush), effects on migrating birds (nesting areas), introduction and spread of noxious and invasive plants, and fragmentation of habitat.

Impacts to biological resources are unlikely during the planning activities associated with Phase 1 of FORGE. However, during parts of Phase 2 and during Phase 3, soil and vegetation disturbance and general construction activity (i.e., noise) could result in biological resource impacts.

Our mitigation and reclamation activities may include avoiding sagebrush stands and sage-grouse leks within the GRRA, avoiding disturbances of nesting birds, revegetating disturbed areas, and replanting or reseeding areas of sagebrush. As part of the NEPA process, biological resource surveys will help to identify the context and intensity of those impacts and help develop mitigation to avoid or lessen project impacts.

Cultural Resources - The proposed project area encompasses a variety of ecological zones of relevance to archaeological resources. A preliminary study found few archaeological surveys in the proposed project area. Most are linear corridor surveys conducted along, and within, certain areas of the site boundary. Predictive modeling indicates that the GRRA will likely contain few prehistoric cultural resources.

The INL Site is within the aboriginal homeland of the Shoshone-Bannock Tribes. To the Shoshone-Bannock people, cultural resources include not only archaeological sites affiliated with their history but also many kinds of natural resources, such as traditionally used plants and animals. Finally, features of the natural landscape (such as buttes, rivers, and caves) often have particular significance to the Tribes. Impacts to cultural resources are unlikely during the planning activities associated with Phase 1 of the GRRA. However, during other parts of Phase 1 and during Phase 2, soil disturbance could result in cultural resource impacts. Our mitigation and reclamation activities may include avoiding cultural resource sites and minimizing soil-disturbing activities that may impact cultural resources or sensitive wildlife and plant species important to the Shoshone-Bannock Tribes. The Tribes have been engaged and offered their support. Cultural resource surveys will help us identify sensitive areas for avoidance. We will also consult with the Idaho State Historic Preservation Office to address any adverse impacts to cultural resources.

Water Resources - Part of the southern portion of the GRRA, south of Highway 20/26, is in the stormwater drainage of the nearby Big Lost River. However, the actual location of the project is outside the stormwater drainage; thus, project activities would not have the potential to affect surface water at the INL Site. Impacts to the ESRP aquifer are not expected because of the depth of the research wells (i.e., well below the aquifer) and the quantities of water needed (i.e., generally less than a single irrigation well). Drilling new wells will require a holding pond for water used in boring activities. FORGE operations will require the use of portable restrooms, resulting in some sanitary waste. INL and the U.S. Geological Survey are experienced in drilling and operating production, monitoring, and observation wells on the INL Site while protecting water resources. Well drilling and operations at the EGS field laboratory will not affect the water quality of the ESRP aquifer. Through INL, we will use best management practices to lessen the impacts from these activities. No other wastewater is expected during the construction or operations activities.

Air Resources - The area surrounding the INL Site is a Prevention of Significant Deterioration Class II area and is designated under the Clean Air Act as an area with reasonable or moderately good air quality, which still allows moderate industrial growth. The Craters of the Moon Wilderness Area, which is about 10.3 km (6.4 mi) southwest of the INL Site boundary (and close to the project area), is a Prevention of Significant Deterioration Class I area and is the

nearest area to the INL Site where additional degradation of local air quality is severely restricted. INL routinely monitors air quality using a network of air monitors. The monitors collect samples to measure particulate matter, radioactivity, and other air pollutants.

Project activities will likely create temporary fugitive dust and emissions during construction activities (e.g., while building roads, well pads, and laydown areas). However, mitigation will lessen the impacts from fugitive dust. Other activities may have emissions (e.g., from portable combustion engines associated with well drilling) that require an Air Permitting Applicability Determination, but these emissions will likely be well within the permitted limits of INL.

Waste Generation and Management - Construction and operations activities will generate some industrial waste that will end up in INL's landfill. Our project activities will not generate hazardous or radioactive waste. Borehole drilling will generate drill cuttings and mud that we will manage under federal, state, and local standards. Process materials and expendables may be disposed of at the INL landfill. Sanitary wastewater will be disposed of through subcontracts to service portable restrooms.

Conditions (Actions that must be completed before the project begins):

Activities involving site characterization, before completing the EA, will require separate ECs to identify conditions and controls to avoid significant environmental impacts. The EA will identify controls and mitigation related to constructing, operating, and maintaining an EGS field laboratory on the INL. Table 1 is a generic list of tasks that will be completed for the EA scoping, technical studies, public/agency comment period, and draft and final document preparation.

Permitting activities focus on construction and operations activities associated with locating the site and well drilling within the GRRA. Research and development activities associated with FORGE may require additional permitting. Table 2 shows permitting and consultation that will likely be required before beginning construction and operations.

Project-Specific Instructions (Actions that must be completed during or at the end of the project):

None

⇩ **Send to ES&S Representative (the NEPA Technical Lead) if a 1st Tier EC or to the appropriate PEL (or designee) if a 2nd Tier EC to Complete Part IV: Section F "Determine Recommended Level of Environmental Review, Identify Reference(s), and State Justification" and Section G "Verify/Approval and Signature Blocks"**

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PART IV:
ES&S Representative, ask applicable TPOCs to verify that the environmental aspects, work activities, conditions, and project-specific instructions are correct and to make changes as necessary. Once you identify the appropriate level of environmental review (Section F), verify that the EC meets the requirements of INL's Environmental Management System (EMS), and seek the appropriate verifications and approvals (Section G).

Note: The PEL (or designee) assumes the responsibility of the ES&S Representative with 2nd Tier ECs and may ask the TPOC's to review the EC, if needed.

SECTION F.	**Determine Recommended Level of Environmental Review, Identify Reference(s), and State Justification:** Identify the level of environmental review (or documentation) by checking the appropriate box or boxes. That is, check Categorical Exclusion number (CX), Environmental Assessment (EA), Environmental Impact Statement (EIS), and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Previously Approved NEPA Document, or Routine Maintenance or Operational activity. Identify the appropriate reference for the box or boxes checked. For instance, the specific categorical exclusion from 10 CFR 1021, or the document numbers for referenced environmental assessments, environmental impact statements, CERCLA record of decisions, or a previously approved EC number.

Choose appropriate level of environmental review (may be more than one):

- ☐ CX
- ☒ EA
- ☐ EIS
- ☐ CERCLA
- ☐ Covered by a Previously Approved EC, EA, or EIS
- ☐ 2nd Tier EC Covered Under an Overarching EC (see ES&S NEPA website for list of overarching ECs)

For projects checked above as "CX," the proposed action must not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environmental, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources (see 10 CFR 1021). In addition, no extraordinary circumstances related to the proposal exist that would affect the significance of the action. In addition, the action is not "connected" to other action actions (40 CFR 1508.25(a)(1) and is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1608.27(b)(7)).

NOTE: *The above paragraph does not apply to EA, EIS, or CERCLA related activities.*

References: 10 CFR 1021 Subpart D 'Typical Classes of Actions', §1021.400 'Level of NEPA review (a)(2) – Require preparation of an EA, but not necessarily an EIS and (c) If a DOE proposal is encompassed within a class of action listed in the appendices to this subpart D, DOE shall proceed with the level of NEPA review indicated for that class of action, unless there are extraordinary circumstances related to the specific proposal that may affect the significance of the environmental effects of the proposal.

Justification: Based on the description of potential environmental impacts (Section E) and DOE's NEPA Implementing Procedures, INL should prepare an EA for the proposed action. See Table 2 for a list of tasks to scope, prepare, and deliver a draft and final EA. Activities involving site characterization, before completing the EA, will require separate ECs to identify conditions and controls to avoid significant environmental impacts. The EA will identify controls and mitigation related to constructing, operating, and maintaining an Enhanced Geothermal Systems (EGS) field laboratory on the INL.

⇩ **Go to Section G, "Verify/Approval and Signature Blocks"**

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SECTION G. Verify/Approval and Signature Blocks

Verify/Approval Block: Instructions for the individuals listed below to verify/approve.

Review the EC in the context given below for your title and send an e-mail to the ES&S Representative verifying, acknowledging, or approving the information described in the EC. Second tier ECs do not require approval by the DOE NEPA Compliance Officer or the BEA EMS Representative; mark those spaces as N/A for Not Applicable.

Program Environmental Lead (or designee): Verifies that they understand the potential environmental impacts (i.e., environmental aspects), that they are complete, and that the conditions and project-specific instructions are appropriate and applicable to the project scope.

Program/Project Manager or Principal Investigator/Researcher: Verifies that the project description is true, accurate, and complete and that they understand the potential environmental impacts of their work, agree with, and commit to implement any conditions or project-specific instruction described in the EC (Sections E and F).

Facility/Tenant Manager: Copy of EC sent for awareness.

DOE NEPA Compliance Officer: Approves the level of environmental review for DOE; that is, makes a NEPA determination (e.g., CX, EA, EIS, CERCLA, or a previously approved EA, EIS, or CERCLA action).

BEA EMS Representative: Verifies that the EC meets the requirements of INL's Environmental Management System (EMS) and approves the EC for BEA.

NOTE: The ES&S Representative will complete the table below and sign the ES&S Signature Block.

Title	Who (Print Name)	Verify/ Approval	Date
Program Environmental Lead (or designee):	R. A. Montgomery	☒	3/23/16
Program/Project Manager or Principal Investigator/Researcher:	R. K. Podgorney	☒	3/23/16
Facility Manager (Copy of EC Sent):	R. J. Bitsoi	n/a	4/13/16
DOE NEPA Compliance Officer:	J. D. Depperschmidt	☒	4/13/16
BEA EMS Representative:	J. S. Irving	☒	4/13/16
		☐	

ES&S Representative Signature Block. Verifies that each EC section, including the above table, is complete and that all pertinent information is received and submitted to the EMS/NEPA Database Manager. Pertinent information includes the final EC, but may also contain supporting documents as appropriate).

John S. Irving	John S. Irving	4/13/2016
Print or Type Name	Signature	Date

DIRECTIONS: Submit the form to the National Environmental Policy Act (NEPA) Technical Lead or the appropriate Program Environmental Lead (PEL) or designee. See the Environmental Points of Contact, NEPA/Environmental Checklist (EC) Support at http://webfiles/es&h/es&s/contacts.pdf) for a list of PELs, Technical Points of Contact (TPOC), and the NEPA Technical Lead.

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Table 1. EA task list.

INL uses the following generic task list to manage the scoping, technical studies, public/agency comment period, and the draft and final document preparation. Applying duration and effort to each task will develop a full 8- to 12-month schedule from the start of scoping activities to the final EA.

Completing the five phases and associated tasks will result in several documents required of the DOE Idaho Operations Office to meet its requirements under NEPA, including an EA Scoping Checklist, a draft EA, a response to public comments, a final EA, and, if applicable, a Finding of No Significant Impact (or FONSI) (designated below by **).

Task	Task
1. Project Management Phase ➢ Draft Planning, Schedule/Cost ➢ Review Comments ➢ Final Planning, Schedule/Cost ➢ Project Closeout **2. Scoping Phase** ➢ Draft EA Scoping Checklist ➢ Prepare Scoping Meeting Material ➢ Scoping Meeting ➢ Prepare Final EA Scoping Checklist ➢ Submit Final EA Scoping Checklist ➢ Project Description Complete Technical Studies & Permits ➢ Risk Assessments (If Needed) ➢ Air Emissions ➢ Cultural Resources ➢ Surface and Groundwater ➢ Geology & Soils ➢ Wildlife / Habitat ➢ Waste Management **3. Draft EA Phase** Prepare Preliminary Draft EA ➢ Prepare EA Sections ➢ Compile Draft EA Sections ➢ Preliminary Draft EA Complete ➢ **Prepare DOE EA Checklist Review Preliminary Draft EA ➢ Environmental Support & Services ➢ Incorporate Comments ➢ INL Team Review ➢ Incorporate Comments ➢ EA Resolution Meeting Prepare Draft EA ➢ Prepare Draft EA ➢ NEPA Compliance Office/Office of Chief Council ➢ Review & Approval ➢ Incorporate Comments ➢ Draft EA Complete ➢ Print Draft EA	Review Media Releases ➢ Prepare Postcard for Stakeholders ➢ Send Postcard to Stakeholders ➢ Prepare News Releases **Distribute Draft EA **4. Public Comment / Response Phase** ➢ Comment / Response Document ➢ Public Comment Period ➢ Evaluate/Respond to Comments ➢ **Prepare Comment / Response Document **5. Final EA Phase** Prepare Final EA ➢ Revise Draft EA ➢ Compile Preliminary Final EA ➢ Preliminary Final Complete Review Preliminary Final EA ➢ Environmental Support & Services ➢ Incorporate Comments ➢ INL Team Review ➢ Incorporate Comments ➢ EA Resolution Meeting Prepare Final EA ➢ Prepare Final EA ➢ NCO/OCC Review & Approval ➢ Incorporate Comments ➢ Final EA Complete ➢ Print Final EA Review Media Releases ➢ Prepare Postcard for Stakeholders ➢ Send Postcard to Stakeholders ➢ Prepare News Releases **Distribute Final EA (and FONSI if applicable)

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Table 2. Permitting strategy.

Permit	Agency	Regulatory Requirement	Estimated Time to Obtain Permit	Comments
Biological				
None	--	--	--	While there are no permits, project activities will require consultation with the U.S. Fish and Wildlife Service and Idaho Department of Fish and Game
Cultural				
None	--	--	--	While there are no permits, project activities will require consultation with the Idaho State Historic Preservation Office and the Advisory Council on Historic Preservation. Consultation takes about 30 days but restarts with requests for additional information
Water				
Injection Well Permit	IDWR	IDAPA 37.03.03	3 Months	IDWR estimated the time at 3 months. However, the permit goes out for public review and could be delayed if there are significant public comments
Monitoring Well Drilling Permits	IDWR	IDAPA 37.03.09	Immediate	IDWR has agreed (CCN 219522) to allow INL to submit an annual monitoring well drilling application. If a well is drilled that was not on the application, it is allowed to be included in the following years application. However, every attempt should be made to include the well in the permit before drilling.
Production Well Drilling Permit	IDWR	IDAPA 37.03.09	2 Months	For production wells, the normal permitting process is followed.
Geothermal Well	IDWR	IDAPA 37.03.04	3 Months	
NPDES General Permit for Discharges from Construction Activities (CGP)	EPA	40 CFR 122 and General Permit	2 Months	The new location overlaps with part of INL's stormwater corridor. Projects that are in the corridor are required to follow the NPDES stormwater requirements for construction activities if the project disturbs 1 acre or more. The CGP will require a stormwater pollution prevention plan and will require final stabilization (e.g., revegetation and asphalt) of the disturbed area.
Air				
None	--	--	--	Fugitive emissions from combustion engines associated with well drilling (e.g., boilers for heat) will require an Air Permitting Applicability Determination but will likely be well within the permitted limits of INL, not requiring a permit or permit modification.
Waste				
None	--	--	--	--

CFR = Code of Federal Regulations
CGP = construction general permit
EPA = U.S. Environmental Protection Agency
IDAPA = Idaho Administrative Procedure Act
IDWR = Idaho Department of Water Resources
NPDES = National Pollutant Discharge Elimination System