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U.S. Department of Energy
Idaho Operations Office

# Idaho National Laboratory Radiological Response Training Range Environmental Assessment

Draft

August 2010

Idaho National Laboratory

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# Environmental Assessment

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**Prepared for the**
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# ACRONYMS

| | |
|---|---|
| AGL | Above Ground Level |
| BEA | Battelle Energy Alliance |
| CAA | Clean Air Act |
| CEQ | Council on Environmental Quality |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CFA | Central Facilities Area |
| CFR | Code of Federal Regulations |
| DoD | U. S. Department of Defense |
| DHS | U. S. Department of Homeland Security |
| DOE | U. S. Department of Energy |
| DoJ | U. S. Department of Justice |
| DOT | U. S. Department of Transportation |
| EOD | Explosive Ordnance Disposal |
| EA | Environmental Assessment |
| EDE | Effective Dose Equivalent |
| EPA | U. S. Environmental Protection Agency |
| ESA | Endangered Species Act |
| FHBC | Fort Hall Business Council |
| GHG | Greenhouse Gas |
| INL | Idaho National Laboratory |
| MFC | Materials and Fuels Complex |
| NAAQS | National Ambient Air Quality Standards |
| NERP | National Environmental Research Park |
| NEPA | National Environmental Policy Act |
| NESHAP | National Emissions Standard for Hazardous Air Pollutants |
| NRAD | Neutron Radiography Reactor |
| NRC | U. S. Nuclear Regulatory Commission |
| PPE | Personal Protective Equipment |
| PSD | Prevention of Significant Deterioration |
| RRTR | Radiological Response Training Range |
| RWMC | Radioactive Waste Management Complex |
| SRPA | Snake River Plain Aquifer |
| STP | Sewage Treatment Plant |
| TAN | Test Area North |
| TSF | Technical Services Facility |
| UAV | Unmanned Aerial Vehicles |
| U. S. | United States |

# GLOSSARY

*Attainment Area:* An area considered to have air quality as good as or better than the National Ambient Air Quality Standards (NAAQS) as defined in the Clean Air Act (CAA). An area may be an attainment for one pollutant and a nonattainment area for others.

*By-Product Material:* In this document, the term "*by-product material*" under the Atomic Energy Act) refers to any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material.

*Cairns:* Rock piles constructed historically and prehistorically to mark features on the landscape, such as travel corridors, caves, or campsites.

*Clean Air Act (CAA):* The Federal Clean Air Act, or "CAA," is the basis for the national air pollution control effort. Basic elements of the act include national ambient air quality standards for major air pollutants, hazardous air pollutants, state attainment plans, motor vehicle emission standards, stationary source emission standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions.

*Clean Water Act (CWA)*: The Clean Water Act is the primary federal law in the United States (U. S.) governing water pollution. Commonly abbreviated as the "CWA," the act established the goals of eliminating releases to water of high amounts of toxic substances, eliminating additional water pollution by 1985, and ensuring that surface waters would meet standards necessary for human sports and recreation by 1983.

*Comprehensive Environmental Response, Compensation, and Liability Act:* The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as "Superfund," created a tax on the chemical and petroleum industries and provided broad federal authority to respond directly to releases of hazardous substances that may endanger public health or the environment. CERCLA established prohibitions and requirements concerning closed and abandoned hazardous waste sites; provided for liability of persons responsible for releases of hazardous wastes; and established a trust fund to provide for cleanup when no responsible party could be identified.

*Curie:* A unit of radioactivity equal to $3.7 \times 10^{10}$ disintegrations per second.

*Effective Dose Equivalent*: The summation of the products of the dose equivalent received by specified tissues of the body and a tissue-specific weighting factor. This sum is a risk-equivalent value and can be used to estimate the health-effects risk of the exposed individual. The tissue-specific weighting factor represents the fraction of the total health risk resulting from uniform whole-body irradiation that would be contributed by that particular tissue. The effective dose equivalent, or EDE, includes the committed EDE from internal deposition of radionuclides and the EDE due to penetrating radiation from sources external to the body. The EDE is expressed in units of rem**.**

*National Ambient Air Quality Standards (NAAQS):* Standards established by the U. S. Environmental Protection Agency (EPA) under authority of the CAA that apply for outdoor air throughout the country. Primary standards are designed to protect human health with an adequate margin of safety, including sensitive populations (such as children, the elderly, and individuals suffering from respiratory disease). Secondary standards are designed to protect public welfare from any known or anticipated adverse effects of a pollutant.

*National Environmental Research Park:* Idaho National Laboratory (INL) is categorized as National Environmental Research Park, or NERP. NERPs are outdoor laboratories that provide opportunities for environmental studies on protected lands that act as buffers around U. S. Department of Energy (DOE) facilities. DOE uses these research parks to evaluate the environmental consequences of energy use and development, as well as strategies to mitigate these effects and demonstrate possible environmental and land-use options. The seven NERPs located in the U. S. are administered through their regional DOE Operations Offices and are coordinated and guided by the Office of Science.

*National Emission Standards for Hazardous Air Pollutants for Radionuclides (Rad NESHAPS):* The CAA requires the EPA to regulate airborne emissions of hazardous air pollutants (HAPs) (including radionuclides) from a specific list of industrial sources called "source categories." Each source category that emits radionuclides in significant quantities must meet technology requirements to control them and is required to meet specific regulatory limits. These standards are the National Emission Standards for Hazardous Air Pollutants for Radionuclides.

*Nonattainment Area:* The CAA and its Amendments of 1990 define a "nonattainment area" as a locality where air pollution levels persistently exceed NAAQS (see glossary), or that contribute to ambient air quality in a nearby area that fails to meet those standards. The EPA gives nonattainment areas a classification based on the severity of the violation and the type of air quality standard they exceed. EPA designations of nonattainment areas are only based on violations of national air quality standards for carbon monoxide, lead, ozone (1-hour), particulate matter (PM-10), and sulfur dioxide.

*Prevention of Significant Deterioration:* This term applies to new major sources or major modifications at existing sources for pollutants where the area the sources are located is in attainment or unclassifiable with the NAAQS. It requires the installation of Best Available Control Technology, air quality analysis, additional impacts analysis, and public involvement.

*Radioactive Materials:* For the purpose of this document "radioactive materials" include (1) sealed radioactive sources; (2) special form sealed radioactive sources; (3) contained (or unsealed) radioactive sources; and (4) dispersible radioactive material. Project personnel would use these materials to produce radiation fields for detection and training during exercises.

> *Sealed Radioactive Sources* – These sources are small metal containers in which a specific amount of a radioactive material is sealed. Manufacturers of these devices must demonstrate protectiveness to receive a license to manufacture and sell them.
>
> *Special Form Sealed Radioactive Sources:* Commercially manufactured sealed radioactive sources that meet the test requirements specified by the U. S. Nuclear Regulatory Commission (NRC) under 10 CFR 71.25. Special form sealed radioactive sources are preferred for temporary placement in outdoor areas due to their robustness of construction to simulate external radiation fields during tests.
>
> *Contained (or Unsealed) Radioactive Sources* – A contained or unsealed radioactive source is encapsulated radioactive material that cannot escape to the environment and cause contamination but does not meet the regulatory standards (10 CFR 71.25) for sealed sources. Some radioactive materials that may be used must be produced at the INL for measurement. These include sources such as irradiated glass that contain trace quantities of isotopes that may be of interest to specific scenarios. INL must produce many of these sources, since they are not all available commercially. The adequacy of the source containment is evaluated on a case-by-case basis prior to use during training exercises. INL's Radiological Protection Program would evaluate the adequacy of the containment and authorize the use during an exercise.
>
> *Dispersed Radioactive Material* – Activated potassium bromide (KBr) that project personnel would disperse at the training sites. This is a short-lived radioactive by-product material that decays to background levels in about two weeks.

*Radiological Work Permit*: The RWP is an administrative mechanism used to establish radiological controls for intended work activities. The RWP informs workers of area radiological conditions and entry requirements and provides a mechanism to relate worker exposure to specific work activities.

*Vadose Zone:* The region of aeration above the water table, which extends from the top of the ground surface to the water table.

# EXECUTIVE SUMMARY

An important aspect of United States (U. S.) national security is to develop and maintain an effective response capability for major radiological incidents. Developing and maintaining the capability to identify the origin of material in response to one of these incidents is a national priority as noted in the Nuclear Forensics and Attribution Act of 2010 (Public Law 111-140). Idaho National Laboratory (INL) has the technical resources necessary to provide direct support to federal agencies responsible for the nuclear forensics mission. Further, INL has a unique capability to provide a large outdoor testing and training range where short-lived dispersed radioactive materials can be disseminated or radioactive sources (i.e., *sealed, special form sealed,* and *contained*, see glossary) placed to provide direct support to federal agencies responsible for the nuclear forensics mission.

The objective of this environmental assessment (EA) is to evaluate the potential environmental impacts of creating and operating a radiological response training range by evaluating two alternative approaches to achieve the proposed action and a 'No Action' alternative. The U. S. Department of Energy (DOE) reviewed several possible on-site and off-site alternatives and determined that the reasonable alternative included two on-site locations; no off-site locations met the site-selection criteria.

Alternative 1 (North and South Training Ranges) focuses radiological activities near Test Area North (TAN) (North Training Range) and near the Radioactive Waste Management Complex (RWMC) (South Training Range). DOE divided the on-site locations into two sub-alternatives: Alternative 1a, 'Maximize Project Flexibility,' and Alternative 1b, 'Minimize Project Impacts.' This EA describes the environmental impacts of the two sub-alternatives and the 'No Action' alternative on air, water, biological, and cultural resources.

These sites would be used to train personnel, test sensors, and develop detection capabilities (both aerial and ground-based) under a variety of scenarios in which *radioactive materials* (see glossary) are used to create a radioactive field for training in activities such as contamination control, site characterization, and field sample collection activities. A typical training exercise would include its own prepared plan and schedule, and involve up to 75 people and 15 vehicles at the range proper.

The dispersed radioactive materials source term was based on the dispersal of 1 *curie* (see glossary) of irradiated potassium bromide. The radiation dose from the release of this source term was modeled for airborne (inhalation), surface (ingestion, inhalation, and external exposure), and ground water (ingestion) release. The CAP88-PC Version 3.0 code was used to compute doses from the atmospheric pathway, GWSCREEN was used to compute groundwater concentrations and doses, and RESRAD Version 6.5 code was used to compute surface pathway doses to an individual living at the range after testing has been completed. The sum of the atmospheric, surface, and groundwater models show the public dose would be about 0.01% of the INL Administrative Control Level for the Public.

While activities would occur in relatively disturbed areas, the surrounding and nearby areas consist of natural vegetation containing wildlife and cultural resources. The impact on Greater sage-grouse and pygmy rabbits and their habitat differs between alternatives, including the sub-alternatives 1a and 1b. Alternative 1a would remove sage-grouse and pygmy rabbit habitat and cause fragmentation of the remaining habitat within the proposed training range. Alternative 1b would not remove sage-grouse and pygmy rabbit habitat or increase habitat fragmentation. Proposed operational controls would minimize potential impacts to sensitive resources, such as sage-grouse, pygmy rabbits, migratory birds, and cultural and archaeological resources.

# Idaho National Laboratory
# Radiological Response Training Range
# Environmental Assessment

## 1.0 PURPOSE AND NEED

An important aspect of United States (U. S.) national security is to develop and maintain an effective response capability for major radiological incidents. Developing and maintaining the capability to identify the origin of material in response to one of these incidents is a national priority as noted in the Nuclear Forensics and Attribution Act of 2010. Idaho National Laboratory (INL) supports training personnel, technology evaluation, and demonstration for federal agencies responsible for the nuclear forensics mission. INL support for these agencies is authorized under the Economy Act of 1932, as amended (31 U.S.C. 1535), and Section 309 of the Homeland Security Act of 2002 (Public Law 107-296, 2002). Under these authorities, the U. S. Department of Homeland Security (DHS) and other federal agencies may access and use the highly specialized expertise and unique capabilities and facilities resident at U. S. Department of Energy (DOE) national laboratories and sites in carrying out their missions.

In the event of an incident, U. S. agencies/authorities must be able to quickly gather and evaluate nuclear forensic information. To maintain this capability, the U. S. national security agencies need to be able to conduct safe, well-characterized, and orchestrated training exercises and technology demonstrations in controlled radiological environments. Responders to any major radiological incident must be able to use a variety of specialized equipment in an effective, timely, and integrated manner to characterize the event.

The INL has supported several exercises and training venues for the nuclear forensics and emergency response communities (i.e., DOE Radiological Assistance Program, DOE's Federal Radiation Monitoring and Assessment Center, DOE Aerial Measurements System, U. S. Department of Defense [DoD] and Department of Justice [DoJ] explosive ordnance disposal [EOD] teams, and National Guard Civil Support teams).[a] With the exception of a small exercise held at INL in 2008, training and exercises conducted by the forensics community have been limited to gamma radiation fields produced using large *special form sealed radioactive sources* (see glossary). Current training scenarios are deficient since they have not used dispersed radioactive materials to develop and test advanced response skills. These skills include radiological protection, decontamination and contamination control, field characterization, and sample collection.

This environmental assessment (EA) evaluates constructing and operating training ranges where field exercises would simulate conditions expected during a major radiological incident. INL has been the only DOE laboratory to conduct indoor and outdoor exercises using specifically designed and characterized radiation/contamination fields that used radioactive materials and sources to support the unique needs of agencies responsible for nuclear forensics. This range would also support larger-scale training, exercises, and technology development activities that emulate radiation and contamination fields that would be encountered by emergency responders.

## 2.0 ALTERNATIVES

### 2.1 Background

DOE proposes to locate a Radiological Response Training Range (RRTR) on the INL Site. The INL, an 890-square-mile reservation in southeastern Idaho (see Figure 1), is managed and operated by Battelle

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a. In addition, other Federal Agencies that deal with consequence management, such as the U. S. Environmental Protection Agency (EPA), have expressed interest in utilizing the Radiological Response Training Range (RRTR).

Energy Alliance (BEA). INL hosts the materials, facilities, and people needed to accommodate a radiological response training and demonstration range. INL also has a large diverse inventory of radioactive sources and materials that, in conjunction with the ability to produce short-lived radioisotopes, would establish a well-characterized environment representative of agency-specified scenarios and training objectives.

As used in this document, the term "dispersed radioactive material," is a general reference to radioactive "by-product material" governed by the Atomic Energy Act and regulated by DOE (specifically, potassium bromide [KBr]) that decays to background levels in about two weeks. KBr, when irradiated in a reactor such as INL's Neutron Radiography (NRAD) reactor, will produce a number of radioactive isotopes that are considered "short-lived" radioactive isotopes. The irradiation will also produce an ultra-trace quantity of three long-lived isotopes (i.e., Ar-39, K-40, and Cl-36). All three occur naturally(Clark and Fritz, 1997). Ar-39 is a noble gas that dissipates in air, while K-40 and Cl-36 occur in such small amounts that they are not distinguishable from the natural background radiation. The short-lived isotope with the longest half-life produced by the irradiation of the salt, excluding Ar-39, K-40,

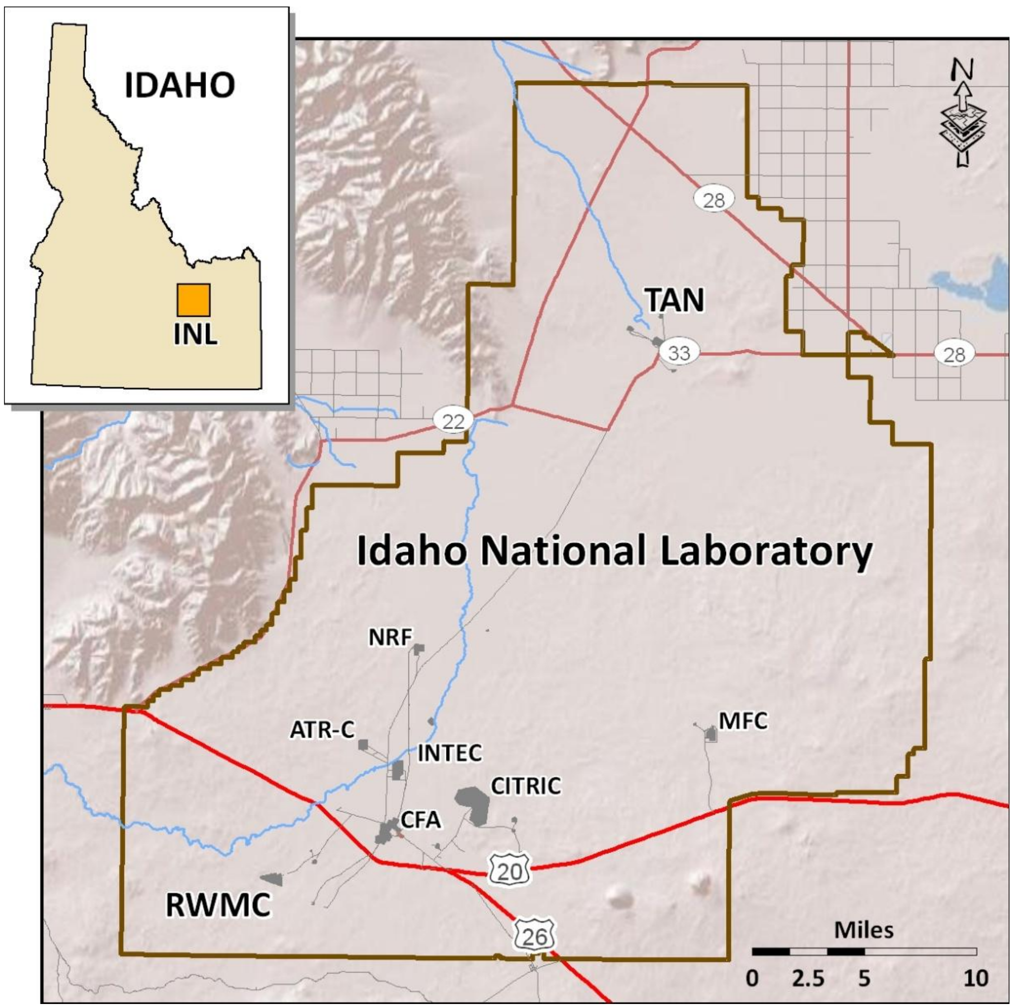


Figure 1. Idaho National Laboratory.

Cl-36, is Br-82, which has a half-life of 1.47 days (35.3 hours). Br-82 contributes the most to the overall decay rate of the activated compound and defines the period of time that the compound remains radioactive—as a rule of thumb—10 half-lives can be used to estimate the amount of time that the Br-82 will take to decay to the stable isotope Kr-82. For KBr, after 353 hours, or about 15 days, the quantity of radioactive material remaining from use in the training exercises will be no longer measurable from natural background radiation.

The objective of this EA is to evaluate the potential environmental impacts of creating and operating a radiological response training range by evaluating and comparing alternative approaches to achieve the proposed action and 'No Action' alternatives. This document was prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969 (Public Law 91 190), as amended; the Council on Environmental Quality's (CEQ) NEPA Regulations (40 Code of Federal Regulations [CFR] Parts 1500 1508); DOE Order 451.1; and DOE NEPA Implementing Regulations (10 CFR Part 1021).

INL has an extensive inventory of radiological material and sources, and has the unique ability to produce the high purity short-lived radioisotopes (i.e., KBr) that will be necessary to support the envisioned radiological exercises. The NRAD reactor and Analytical Laboratory at INL's Materials and Fuels Complex (MFC) are assets that can readily prepare and produce the irradiated KBr on demand and without introduction of unwanted istopes with longer half-lives.

## 2.2 Range of Reasonable Alternatives and Siting Analysis Criteria

The CEQ's NEPA regulations require agencies to identify and assess reasonable alternatives (40 CFR 1500.2(e)) when proposing new activities. DOE has developed a set of site-selection criteria, based on programmatic objectives to help identify alternatives, meet the purpose and need, and satisfy program requirements (see inset box on the next page). DOE searched for an appropriate training range site at INL because one of the most important criteria is access to a facility capable of producing short half-life radioactive material[b]. DOE also looked at other DOE facilities, but found that such facilities did not meet the program expectations of conducting and supporting the described training that can be accomplished at INL. Further, no other DOE location satisfies all of the listed criteria.

With respect to the INL Site, DOE looked for areas that would minimize potential environmental impacts from these proposed activities. DOE considered disturbed sites at INL, including legacy-contaminated areas such as *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) (see glossary) sites, gravel pits, other "ranges" or test areas, and recently demolished facility areas. DOE eliminated using CERCLA sites because: (1) the program required an accurate determination of the radionuclide inventory in an area for a broad range of radionuclides and the characterization data does not meet project requirements due to the presence of legacy radionuclides that are stratified at different soil depths and may confound test activities; (2) the background contamination may complicate quantifying the activated KBr; and (3) they would not represent sites with only fallout and radioactive materials dispersed on surfaces.

DOE chose to analyze a set of three locations as the proposed alternative that would accomplish the agency's purpose and need and meet all of the siting criteria (see Section 2.3). In addition, based on biological and cultural resource surveys, DOE chose to expand alternative 1 to two sub-alternatives related to the north location: (1) 'maximizing training flexibility' and (2) 'minimizing project impacts.' In addition, per CEQ regulations, this document analyzes a 'No Action' alternative (see Section 2.4) as well.

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b. **Note:** Because the materials needed for testing decay quickly, it is essential to have the reactor producing and the laboratory confirming the purity of the short-lived isotopes close to the training location. INL personnel have unique expertise and training in producing and handling radioactive materials to support the described activities.

## 2.3 Alternative 1 – North and South Training Ranges

Alternative 1 establishes two outdoor Radiological Response Training Ranges—a North Training Range and a South Training Range. The North Training Range consists of a short section (<1 mile) of T-28 (north of the gravel pit), a section (~0.4 miles) of access road (south of the gravel pit), an 'arching' road across the top of the area (~1.0 mile), the T-28 Gravel Pit (9 acres), a berm/ditch structure (0.75 miles), a large area (825 acres) surrounding the gravel pit, the TAN parking lot (~2.5 acres), and an area consisting of the old TAN Facility (23.5 acres) (see Figure 2). The South Training Range consists of a radiological work area (~7.5 acres), a smaller area (~3.0 acres) just adjacent to and west of the radiological work area, two small areas (~3.4 and 0.3 acres) along the access road, and the parking area (~5.0 acres) just south of INL's Radioactive Waste Management Complex (RWMC) (see Figure 2). INL would continue to use the gravel pit to mine gravel for on-site uses; however, access may be restricted during and after training exercises while radioactive levels decay to pre-test background levels.

These sites would be used to train personnel, test sensors, and develop detection capabilities (both aerial and ground-based) under a variety of scenarios using (1) sealed radioactive sources (see glossary), *(2) Special Form Sealed Radioactive Sources* (see glossary), *(3) Contained (or Unsealed) Radioactive Sources* (see glossary), *and (4) dispersed radioactive material* (see glossary). Training would include: (1) evaluation of command and control protocols; (2) site characterization with aerial surveys and remote radiation measurements on well-defined gamma emitting radiation fields; (3) activities that support ground-based sample collections; and (4) contamination control and decontamination operations. The different locations allow range users flexibility in planning their training activities. INL personnel would conduct training and demonstrations on an as-needed basis and incorporate the respective areas that best satisfy the specific training objectives. Project activities include: (1) preparing the site; (2) operating the site; (3) performing training exercises at the site; and (4) post training and post exercise activities (see Table 1 for specifics). Table 2 (in Section 2.5) describes "operational controls" necessary to avoid or limit impacts to natural, ecological, or cultural resources, and to avoid contaminating the environment or exposing the public or employees to radioactive materials.

**Site Selection Criteria**

- Location in close proximity to facilities that produce the dispersed radioactive materials:
    - to minimize shipping distances
    - to minimize loss of activity from radioactive decay of the materials.
- Location in close proximity to facilities that can produce a diverse inventory of radioactive materials.
- Locations must not have legacy radionuclides that may confound sample collection and field characterization activities.
- Locations must have specialized infrastructure and expertise to handle these materials in choreographed training and exercise scenarios.
- Test areas must be able to tailor the environment to required scenarios by varying contamination levels, patterns, and emplacement of radioactive sources with varied dispersal methods.
- Locations must be remote and isolated from the public.
- Locations must be semi-arid to minimize the likelihood of short-lived dispersed contamination being diluted or washed away.
- Locations must be able to accommodate aircraft (both manned and unmanned) for aerial surveillance and characterization.
- Locations must be able to restrict access until radiation levels have returned to background levels (about two weeks).
- Locations must provide for sufficient staging area to support assembly and command post operations.
- Locations must provide readily accessible radiological facilities (i.e., hot cells, radioanalytical laboratories, etc.) and forensics expertise necessary to design and choreograph, setup, and execute a variety of exercise scenarios and demonstrations.

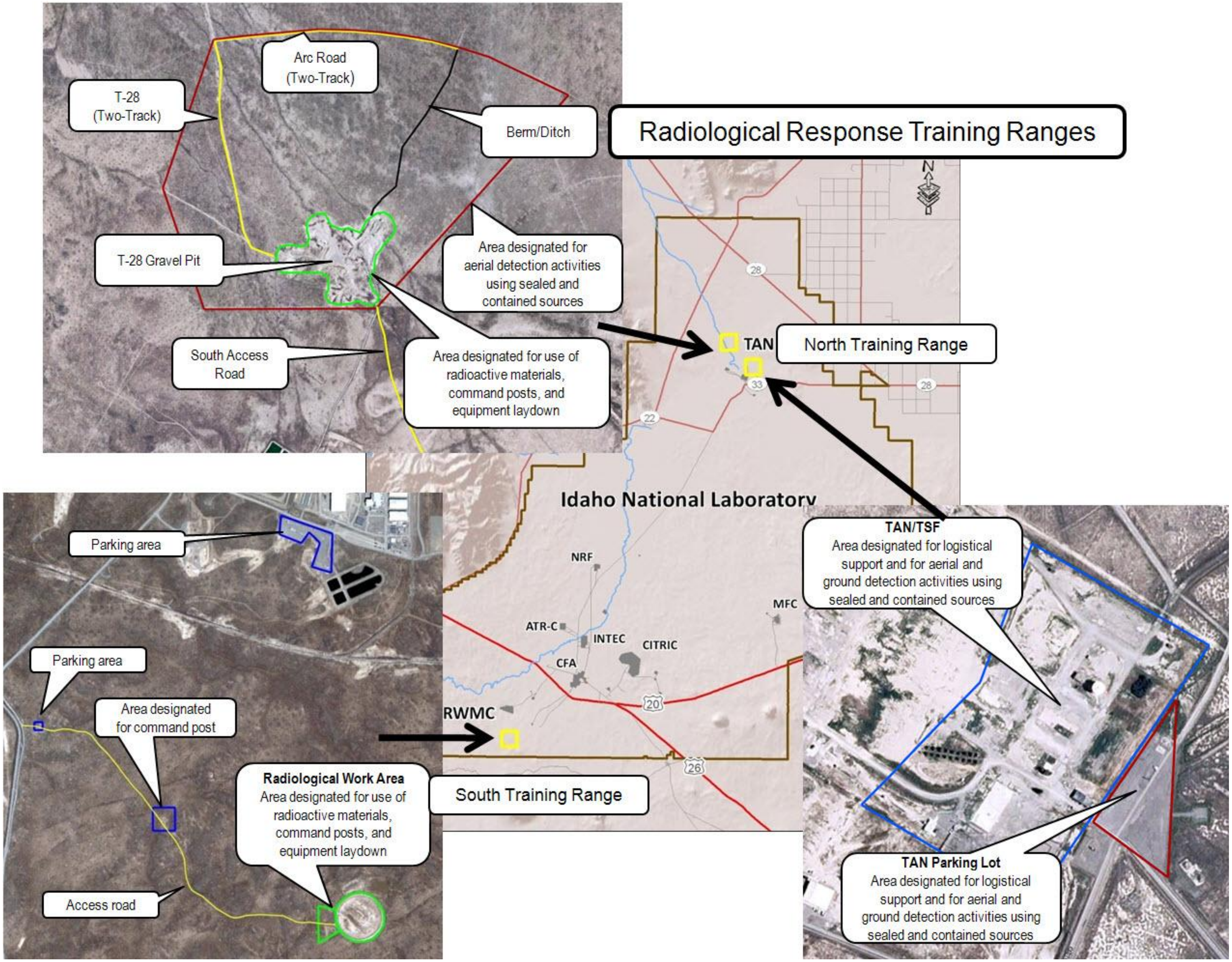



Figure 2. INL's Radiological Response Training Range.

Table 1. Project activities related to (1) preparing, (2) operating, (3) training, and (4) post training & post exercises activities at the sites.

**Activities to Prepare Sites**

- Contour the gravel pit area to grade/compact the earth.
- Mow vegetation (grasses and brush) where project activities would place command posts or laydown areas.
- Use about 600 gallons/test water to apply the KBr. Store water in several 200–500 gallon polyethylene containers on-site. Apply about 1000 gallons/day of water for dust control on roadways and parking lots.
- Construct small temporary structures or appropriate props to simulated urban environments.
- Establish tent set-up areas for decontaminating personnel and equipment.
- Establish a base area for tents or trailers to support equipment storage, mission planning and data assessment activities, communication activities, and sleeping and eating accommodations.
- Conduct pre-survey (i.e., soils, etc.) for legacy radioactive contaminants and as appropriate surveys for cultural and biological resources (i.e., archaeological and nesting bird surveys). **Note**: Surveys for radioactive contaminants and cultural resources only occur once; however, nesting bird surveys may need to occur throughout the nesting season depending on the frequency of project activities in the area.

**Operating Activities**

- Control site access for security in accordance with a project security plan.
- Irradiate KBr at an irradiation facility (project personnel receive a 'purity statement' attesting to the purity of the isotope, assuring that project personnel know the isotopes produced during irradiation).
- Determine the maximum amount of KBr salt (up to 500 grams, but less than *1 curie,* [see glossary]) to be used for each test and identify/quantify any chemical contaminants present.
- Transport the KBr to the testing site using U. S. Department of Transportation (DOT) approved methods and transport containers.
- Verifying the curie content and isotopic distribution—both of the curies of the major, intended isotopes, and any from tramp contaminants[c] (maximum of 1 curie at time of dispersal—see inset table for isotope breakdown) (ECAR-334, 2008).
- Disperse the short-lived KBr in accordance with scenario requirements. It is expected that 12 or fewer tests would occur annually. These tests may include:
  - Application as powders using spreaders
  - Dissolving in water and applying with sprayers (for precise control of KBr levels and deposition pattern)
  - Using $CO_2$ or compressed air gas jet to disperse the KBr radionuclide as a powder with a specified particle size without explosive residues
  - Using explosives, such as C-4 or equivalent (about ½-pound), to disperse the KBr radionuclide and the materials.
- Radioactive sources may be used to calibrate instruments and radioactive materials may be used as training materials. The following list is representative, but not a comprehensive sampling, of isotopes that may be used for training: $^{137}$Cs, $^{60}$Co, $^{192}$Ir, $^{75}$Se, $^{226}$Ra, and isotopes of U, Pu, Am, and Th (*Note: Source material under the Atomic Energy Act is uranium, thorium, or any other material which is determined by the Commission to be source material; or ores containing one or more of the foregoing materials, in such concentration as the Commission may determine from time to time*). Project personnel would use the INL radiological control and work permit process with other hazard identification and mitigation procedures to select and control the isotopes used for training events.
- Dispersal of KBr would occur only when wind speeds are less than 10 miles per hour. Wind speed would be monitored and dispersal of KBr would be terminated if wind speeds exceed 10 miles per hour.

**KBr Source Term (in curies)**

| Radionuclide | Curies | Half-life (Years) |
|---|---|---|
| P-33 | 1.357E-12 | 6.95E-02 |
| Cl-36 | 2.258E-10 | 3.01E+05 |
| Cl-38 | 2.890E-12 | 7.07E-05 |
| Ar-39 | 1.479E-6 | 2.69E+02 |
| Ar-41 | 2.106E-6 | 2.07E-04 |
| K-40 | 3.803E-9 | 1.28E+09 |
| K-42 | 4.260E-2 | 1.41E-03 |
| K-43 | 1.133E-9 | 2.58E-03 |
| Se-81 | 5.417E-14 | 3.52E-05 |
| Se-81m | 3.669E-14 | 1.09E-04 |
| Br-80 | 2.500E-1 | 3.31E-05 |
| Br-80m | 2.339E-1 | 5.04E-04 |
| Br-82 | 4.731E-1 | 4.03E-03 |
| Br-82m | 000E+00 | 1.17E-05 |
| Br-83 | 1.936E-8 | 2.73E-04 |
| Kr-79 | 9.409E-12 | 4.00E-03 |
| Kr-83m | 6.532E-8 | 3.48E-06 |
| **Total** | **1.00E+00** | **--** |

c. Unwanted or unneeded trace or minor constituents.

| |
|---|
| • Project activities at the T-28 Gravel Pit would not occur during high water. |
| **Training Exercise Activities** |
| • Use gasoline/diesel generators for electrical power.<br>• Use ground robots for sample collection and site surveillance activities.<br>• Use portable toilets or sanitary facilities.<br>• Place cargo containers, old vehicles, and similar objects in the training range to test sample collection methodologies.<br>• Use stakes to anchor equipment and spray paint, stakes, and rope to mark areas as appropriate.<br>• Collect ground soil samples and surface smears off objects located in the training range.<br>• Use surrogate materials ($CaCl_2$ etc.) to test application methods (~200 grams per test).<br>• Transport personnel and equipment in all-terrain or utility (gators) vehicles (ATVs) along approved roads, berms, T-28 Gravel Pit in the North Training Area, and the Radiological Work Area in the South Training Area for characterization and sample collection.<br>• Practice decontamination procedures on personnel and equipment with cloth and wet (water spray) methods.<br>• Dismantle, store, and dispose of temporary structures following testing.<br>• Store contaminated equipment and clothing until all detectable radionuclides are decayed then disposed as conditional waste or surveyed as free for release and reuse.<br>• Dispose cold waste through Waste Generator Services.<br>• Collect samples for a post-survey of the area.<br>• Conduct interrogation and characterization of surrogate suspect packages and devices using a variety of high-energy techniques including X-ray, flash x-ray, portable isotopic neutron spectroscopy, and radiation generating devices.<br>• Use aerial platforms, including fixed or rotary wing (including fueling the helicopter) aircraft or unmanned aerial vehicles, to fly over the RRTR (T-28 Gravel Pit and surrounding area). These aircraft would have onboard sensor platforms to detect radioactivity and provide mapping of the area. Aircraft would fly over the range at varying altitude above ground levels. The flights may involve multiple flyovers in patterns or a single flyover. The number of flights per exercise would vary with the training requirements. Not all exercises would require aircraft activity. |
| **Post-Training and Post Exercise Activities** |
| • Radiation levels (as measured with a micro-rem meter) will be monitored after release of activated KBr, which is done to limit access to the area until released by Radiation Control.<br>• The continued use of the gravel pit to mine gravel will be on-going. Access would be controlled during and after training and exercises until the area is released for unrestricted use.<br>• Perform a Radiological Assessment (see Table 2). |

## Waste Management:

Operations at the RRTR would generate several types of waste: (1) common trash; (2) low-level radioactive waste; and (3) liquid waste. Common trash would consist of routine office trash, non-radioactive personal protective equipment (PPE) (i.e., gloves, etc), and PPE which was initially radioactive, but was stored until radioactive constituents decayed to background levels. Routine office trash and non-radioactive PPE would be disposed at the state-regulated INL landfill.

Non-liquid low-level radioactive waste would include PPE used to enter the training area and sample material generated during training (i.e., analytical waste, soil, and wipes). All non-liquid low-level radioactive waste would be stored in accordance with INL procedures to allow decay of the radioactive constituents. After decay, the non-soil solid waste would be disposed at the state-regulated INL landfill, and soil samples returned to the training area after decay.

Liquid low-level radioactive waste would include water used to decontaminate personnel exiting the training area, liquid laboratory analytical waste, and sewage. All low-level decontamination water would be stored in accordance with INL procedures to allow decay to background levels of the radioactive constituents.

After decay, the decontamination wastewater would be disposed to INL's Central Facilities Area (CFA) Sewage Treatment Plant (STP), since requirements do not allow disposal of decontamination wastewater off the INL Site. Project personnel would obtain approval from INL Facilities and Site Services for disposing decontamination wastewater to the CFA STP. Laboratory analytical waste would be solidified, allowed to decay if radioactive, and disposed at the state-regulated INL landfill; none of the laboratory waste is expected to be classified as hazardous waste.

A commercial vendor, holding a valid State of Idaho permit, would supply and pump portable toilets for the use of those participating in the training exercises at the remote locations (i.e., North and South Training Ranges). Wastewater pumped from the portable toilets must be discharged to the CFA STP. The CFA STP must be included on the commercial vendors' State of Idaho approved list of disposal sites prior to discharge. INL Facilities and Site Services must grant project personnel approval to dispose wastes to the CFA STP.

Project personnel would manage any hazardous waste generated in accordance with state regulations and disposed at a permitted off-INL facility.

**Typical Training Exercise:**

Each training exercise could include up to 75 people and 15 vehicles at the range and conducted according to its own carefully prepared plan and schedule. Before the exercise, project personnel would perform a radiation background check and place monitoring equipment (such as air samplers for radiation monitoring) to verify initial conditions. Support equipment would include items such as radios, generators, and cargo containers, and command tents would also be set up as required. The radiological materials to be used would be carefully packaged and transported to the training ground and placed and/or dispersed according to the previously approved plan. The entire area would be carefully controlled in accordance with the security plan to prevent unauthorized persons from inadvertently entering. INL personnel would thoroughly brief training participants before each exercise about what is to take place, any potential hazards that may exist, and the expected course of the exercise events.

For some exercises, INL personnel would place sealed radioactive sources, special form sealed radioactive sources, and contained (or unsealed) radioactive sources in approved areas. The sealed and contained sources will be removed from the exercise area on a daily basis and before the training event has concluded. For other exercises, INL personnel would disperse minute quantities of material in a liquid sprayed on the ground, spread dry, or in the air (through aerosol or small explosive dispersal). Trainees would use specialized equipment (see Table 1, 'Training Exercise Activities') to characterize the radiation fields or areas, obtain radiation readings, train with disablement tools, and collect samples in the test area to gain proficiency in using instruments and techniques to characterize an incident scene. Laboratory personnel will take measurements on samples of KBr obtained from the field or radioactive source materials and will store samples in locked containers that are appropriately shielded. When possible, non-toxic shielding (i.e., tungsten, bismuth) will be used in place of lead shot/shielding.

The activities would continue for several days, depending on the exercise being conducted, and may include aerial-based monitoring of the test area. After each exercise, project personnel would remove and store test equipment and any sealed and contained source materials, and continue monitoring the test area until background radiation levels return to normal pre-test levels. DOE would then release the test area for unrestricted use.

This EA analyzes two sub-alternatives: Alternative 1a 'Maximizing Training Flexibility' (see Section 2.3.1, refer to Figure 2) and Alternative 1b 'Minimizing Project Impacts' (see Section 2.3.2, refer to Figure 2), as well as the following descriptions.

### 2.3.1 Alternative 1a – Maximizing Training Flexibility

This alternative gives DOE the maximum training flexibility in conducting training exercises, as described above and below at the following locations.

**North Training Range:**

- *T-28 Gravel Pit:* Project personnel would use the T-28 gravel pit for radiological work (i.e., dispersing irradiated KBr via mechanisms such as spraying [liquid] on the ground or dispersing [aerosol] through the air using explosives or other mechanisms [i.e., gas, guns, etc.], and placement of sealed radioactive sources, special form sealed radioactive sources, and contained (or unsealed) radioactive sources. Mowing, grading, and leveling of small areas of the pit to remove or reduce vegetation for command centers, radiological source preparation, decontamination areas, and equipment storage. Project activities would not extend beyond the obvious boundaries of the gravel pit; in cases where the boundary is not clearly defined, project personnel would work with those responsible for the pit to place markers to identify the boundary.
- *T-28 Road (North of the T-28 Gravel Pit):* Project personnel would use T-28 for placement of the command centers and for travel to the west side of the larger area. Project personnel would identify two locations (100 x 100-feet each) to place command centers along the road (some adjustments would occur to protect sensitive cultural resources or wildlife). Project personnel would place sealed radioactive sources, special form sealed radioactive sources, and contained (or unsealed) radioactive sources in the approved exercise areas. To meet wildland fire requirements, mowing may occur to allow for a 30-foot buffer within the area for the command posts; however, mowing will not occur in culturally sensitive areas.
- *T-28 Road and Access Road (South of the T-28 Gravel Pit) and the arc road and the berm/ditch structure (Northeast of the T-28 Gravel Pit):* Project personnel would use the berm leading out of the northeast part of the gravel pit, the arch road across the top of the area, and T-28 to travel around the area on small vehicles to place and detect sealed sources. Project personnel would leave vehicles on the road and travel on foot to place sealed sources within the larger area. Further, there would be no off-road vehicle travel, or any extended stay, along those two-track roads or berm/ditch (see Figure 3). Project personnel would limit travel on the berm/ditch to ATVs, but may use light trucks on T-28 and the arc two-track roads. In addition, project personnel would use the small disturbed areas just outside the south boundary of the gravel pit (right and left of the entrance road) as equipment laydown/storage areas along the southeast road for placement of command posts (100 x 100 feet).

Figure 3. Berm/Ditch, Looking from north to south from the 'Arc' road toward the T-28 Gravel Pit

- *Large area surrounding the T-28 Pit:* Project personnel would use this area to place sealed and contained sources; no other radiological work, other than allowed by the above description, would occur within this boundary. Entry to this area would be via foot traffic only.
- *Fly Over:* Project personnel would conduct flyovers of the North Training Range (T-28 Gravel Pit and surrounding area) to detect irradiated isotopes and sealed sources up to 12 week-long exercises per year:
    - Project activities may include using aerial platforms (such as fixed or rotary wing aircraft or unmanned aerial vehicles [UAV]) to fly over the RRTR. These aircraft would have sensor platforms to detect radioactivity and provide mapping of the area. Aircraft would fly over the range at varying above ground levels (AGL), possibly as low as 100 feet AGL or higher. The

flights may involve multiple flyovers in patterns using paths determined by the trainees (e.g., along a north-south grid followed by an east-west grid on 100-meter flight line centers at multiple locations and speeds) or a single flyover. The number of flights per exercise would vary with the training requirements. Not all exercises would require aircraft activity. Some exercises may require multiple daily flyovers or flights during the exercise period. Fixed or rotary wing aircraft or UAVs may be leased and/or controlled by DOE or the group undergoing training (e.g., a military aircraft).

  - Overflights would be restricted to North and South Training Ranges. Overflights of occupied facilities at the INL would not occur in relation to the RRTR activities without a separate evaluation. Some rotary wing aircraft may land at the INL for refueling. In addition, project activities involving UAV's may use INL's UAV landing strip.
  - All aircraft operational activities would require extensive INL coordination and review processes, including flight planning, refueling plans, frequency reviews, security planning, and associated concerns.

- *TAN/TSF Area:* Project personnel would use the TAN/TSF area as equipment laydown and storage, including the storage and placement of sealed and contained sources for aerial and ground surveys.
- *TAN Parking Lot:* Project personnel would use the parking lot area to place sealed and contained sources; no other radiological work would occur in this area. Aerial and ground surveys to detect sealed and contained sources would occur in this area as well.

**South Training Range:**

- *Parking lot near RWMC:* Project personnel would use this area of the South Training Range for parking and non-radioactive equipment storage only. To meet wildland fire requirements, mowing may occur to allow for a 30-foot buffer within the current disturbed area; however, mowing will not occur in culturally sensitive areas. Project personnel would not use radioactive material in the parking lot.
- *Road to Radiological Work Areas:* Other than the "West Gate Area" and the "Center Area," project personnel would only use the road to travel to and from the Radiological Work Area. Project personnel would not use areas along the road, other than those identified below, for purposes other than travel. Project personnel would not conduct any radiological work, including the use of sealed sources, in this area.
- *West Gate Area:* Project personnel would use this area for parking and the placement of command centers. Parking and the placement of the command centers would occur only on previously disturbed parts of the area. To meet wildland fire requirements, mowing may occur to allow for a 30-foot buffer within the current disturbed area; however, mowing will not occur in culturally sensitive areas. There would be no radiological work done at this area.
- *Center Area (along road to radiological work areas):* Project personnel would use this area for parking and the placement of command centers. Parking and the placement of the command centers would occur only on previously disturbed parts of the area. To meet wildland fire requirements, mowing may occur to allow for a 30-foot buffer within the current disturbed area; however, mowing will not occur in culturally sensitive areas. Project personnel would not conduct any radiological work, including the use of sealed sources, in this area.

- *Radiological Work Area:* Radiological work would occur within the radiological work area (see Figure 2 & Figure 4) Project personnel would use the radiological work area to prepare and disperse irradiated KBr via mechanisms such as spraying [liquid] on the ground or dispersing [aerosol] using other mechanisms and placement of sealed radioactive sources, special form sealed radioactive sources, and contained (or unsealed) radioactive sources. Project personnel would restrict their activities in the area adjacent to and west of the radiological work area to previously disturbed areas. To meet wildland fire requirements, mowing may occur to allow for a 30-foot buffer within the current disturbed area; however, mowing will not occur in culturally sensitive areas. No work with sealed and contained sources would occur at this site outside the Radiological Work Area boundaries. Project personnel would place a camera (with a sealed source) on the berm, but would not go farther out beyond the berm.

Figure 4. South Training Range area during initial testing activities.

### 2.3.2 Alternative 1b – Minimizing Project Impacts

This alternative restricts project activities in the areas surrounding the T-28 Gravel Pit to minimize impact to biological and cultural resources. The project activities at the other locations (i.e., TAN/TSF, TAN Parking Lot, and the South Training Range) would remain the same as described in Alternative 1a.

**North Training Range:**

- *T-28 Road (North of the T-28 Gravel Pit):* Project personnel would not use T-28 for placement of the command centers; however, project activities would use T-28 (north of the gravel pit) to place and detect sealed sources in the larger area around the gravel pit. No activities along T-28 (north of the gravel pit) would require mowing to protect against wildland fire.
- *All other activities around the T-28 Gravel Pit would remain unchanged from Alternative 1a, including:*
  - *T-28 Gravel Pit*
  - *T-28 Road and Access Road (South of the T-28 Gravel Pit) and the arc road and the berm/ditch structure (Northeast of the T-28 Gravel Pit)*
  - *Large area surrounding the T-28 pit*
  - *Flyovers*
  - *TAN/TSF Area*
  - *TAN Parking Lot.*

**South Training Range:**

- Same as in Alternative 1a.

## 2.4 Alternative 2 – No Action

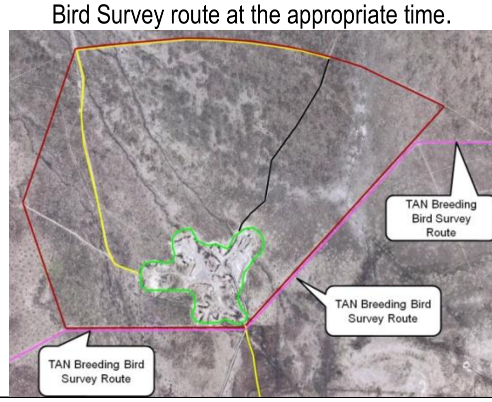
DOE must consider a no action alternative in all of its EAs; the selection of the no action alternative means that the proposed activity, as described in Section 2.3, would not take place. For this EA, that means personnel would not receive training at INL to execute effective responses to major radiological incidents, including developing and testing tools and field methodology under realistic scenarios. 'No action' does not meet the purpose and need for the RRTR, and would decrease the ability to respond to major radiological incidents and increase risks to first responders, characterization personnel, and the public.

INL would continue to use the gravel pit to mine gravel for various on-site uses. The TAN/TSF and parking area and areas south of RWMC would be available for other uses or reclamation activities.

## 2.5 Operational Controls

If DOE selects the proposed action, they would adopt operational controls as an integral part of its plan to help reduce the impacts of the action, and lower the potential for significant impacts (see Table 2).

Table 2. Operational controls to avoid or lessen impacts to natural, ecological, and cultural resources.

| Activity | Control |
|---|---|
| Vegetation removal or soil disturbance | • Conduct nesting bird surveys before disturbance between May 1 and September 1.<br>• Limit size of areas disturbed.<br>• Revegetate project-related disturbed area with native species when closing the training range.<br>• Project personnel will follow INL's Sitewide Noxious Weed Management Plan (Plan 611) to protect against the spread of noxious and invasive weeds—Soil and vegetation disturbing activities, including those associated with mowing, blading, and grubbing, have the potential to increase noxious weeds and invasive plant species that would be managed according to 7 USC § 2814, "Management of Undesirable Plants on Federal Lands," and Executive Order 13112, "Invasive Species." Project personnel would follow the applicable requirements to manage undesirable plants in the project areas, including spraying for noxious and invasive weeds. |
| Release of radionuclides to the environment | • Periodically (no less than five years) perform a biota dose assessment at the North or South Training Range (see Section 4.1.2.1, 'Radiological Assessment'). |
| Limiting access to the TAN Breeding Bird Survey route | • Coordinate range operation to allow access to conduct the TAN Breeding Bird Survey route at the appropriate time.<br><br><br>*Inset: Part of the 'TAN' Breeding route runs along the eastern and southern boundary of the North Training Range, then across the southern part of the 'sealed and contained source area'.* |
| Soil disturbance at the following project area:<br>• Parking Lot near RWMC<br>• Road to Radiological Work Area<br>• West Gate Command, Storage, and Parking Area<br>• Center Command, Storage, and Parking Area<br>• Radiological Work Area<br>• TSF Administrative Area<br>• Parking Lot east of TSF Area<br>• T-28 South Gravel Pit<br>• T-28 Road Corridor | • Minimize ground disturbance.<br>• Project personnel would notify and receive approval from Cultural Resource Management personnel before setting up and staging temporary command post to avoid impacts to cultural resources.<br>• Periodically (or as needed to assure project activities do not cause adverse impact) complete cultural resource monitoring in sensitive areas with authority to redirect work to avoid any sensitive materials discovered.<br>• Implement a stop work procedure to guide the assessment and protection of any unanticipated discoveries of cultural materials.<br>• Complete cultural resource sensitivity training for project personnel to discourage unauthorized artifact collection, off-road vehicle use, and other activities that may impact cultural resources. Encourage a sense of stewardship for cultural resources, including tribally sensitive plants and |

| | |
|---|---|
| • Project Boundary surrounding T-28 South Gravel Pit | animals.<br>• Minimize disturbance to wildlife species important to the Shoshone-Bannock Tribes by using appropriate methods, which could include seasonal or time-of-day restrictions, good housekeeping, and awareness training. |

# 3.0 AFFECTED ENVIRONMENT

INL consists of eight major facilities, each less than 2-square miles, situated on an 890-square-mile expanse of otherwise undeveloped, cool, desert terrain, and with most INL buildings and structures occurring within these developed site areas and separated by miles of primarily undeveloped land. DOE controls all INL Site land (see Figure 1), which occupies portions of five Idaho counties: Butte, Bingham, Bonneville, Clark, and Jefferson. Population centers in the region include large cities (>10,000) such as Idaho Falls, Pocatello, Rexburg, and Blackfoot, located greater than 30 miles to the east and south, and several smaller cities/communities (<10,000) located around the site (about 1-30 miles away), such as Arco, Howe, Mud Lake, Fort Hall Indian Reservation, and Atomic City (see Figure 1). Craters of the Moon National Monument is less than 20 miles to the west; Yellowstone and Grand Teton National Parks and the city of Jackson, WY are located more than 70 miles northeast. No permanent residents exist on the INL Site.

The five Idaho counties that are part of the INL Site are all in *attainment area* (see glossary) or are unclassified for National Ambient Air Quality Standards (NAAQS) status under the *Clean Air Act (CAA)* (see glossary). The nearest *nonattainment area* (see glossary) is located about 50 miles south of INL in Power and Bannock counties. INL is classified under the *Prevention of Significant Deterioration (PSD)* (see glossary) regulations as a Class II area—an area with reasonable or moderately good air quality.

Surface waters on the site include the Big Lost River and Birch Creek; both streams carry water on an irregular basis, with the majority of the flow diverted for irrigation before entering INL. During high water years or during the shutdown of the diversion, Birch Creek has the potential to flow down its historic channel and through parts of T-28 and the gravel pit. Most of INL is underlain by the Snake River Plain Aquifer (SRPA), which lies between 220 feet (at TAN) to 610 feet (at the South Training Range) below the site. The geology above the SRPA, the *vadose zone* (see glossary), is generally comprised of basalt (95%) with a layer of soil (loess) and/or sediment on top of the basalt with thin layers of sediments (1 to 20-foot intervals) between basalt flows. The SRPA has similar geology as the overlying vadose zone and is generally 250 to 900-feet thick.

The natural vegetation of the INL 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 (Shumar and Anderson 1986). Other common shrubs include green rabbitbrush, winterfat, spiney hopsage, gray horsebrush, gray rabbitbrush, and prickly phlox (Anderson et al. 1996). The shrub understory consists of native grasses, thickspiked wheatgrass, Indian ricegrass, bottlebrush squirreltail, needle-and-thread grass, Nevada bluegrass, and bluebunch wheatgrass and native forbs (i.e., tabertip hawksbeard, Hood’s phlox, hoary false yarrow, paintbrush, globe-mallow, buckwheat, lupine, milkvetches, and mustards) (Anderson et al. 1996). In a 1999 proclamation, the Secretary of Energy designated a portion of INL as the Sagebrush Steppe Ecosystem Reserve with a mission to provide research opportunities and preserve sagebrush steppe habitat. Representatives of the Bureau of Land management, U. S. Fish and Wildlife Service, and the Idaho Department of Fish and Game co-signed the proclamation. In addition, the INL Site is designated as *National Environmental Research Park* (NERP) (see glossary).

A wide range of vertebrate species are located within the site; several species are considered sagebrush-obligate species, meaning that they rely upon sagebrush for survival. These species include sage sparrow, Brewer’s sparrow, northern sagebrush lizard, Greater sage-grouse, and pygmy rabbit.

There are currently no species that occur on the INL that are listed as Endangered or Threatened; however, several Species of Concern or Candidate Species, including sage-grouse, long-eared myotis, small-footed myotis, Townsend's big-eared bat, pygmy rabbit, Merriam's shrew, sage-grouse, long-billed curlew, ferruginous hawk, northern sagebrush lizard, and loggerhead shrike, do occur on the site.

Geographically, INL is included within a large territory once inhabited by, and still of importance to, 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 as well, 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.

The INL Site has a rich and varied cultural resource record due to its continuous access restriction and geographic remoteness. This includes localities that provide an important paleontological context for the region and the many prehistoric archaeological sites. These campsites, *cairns* (see glossary), and hunting blinds provide information about the activities of aboriginal hunting and gathering groups who inhabited the area for at least 13,500 years. The archaeological sites, pictographs, caves, and many other features are important to contemporary Native American groups for historic, religious, and traditional reasons. Many historic sites document the area's use during the late 1800s and early 1900s, including the abandoned town of Pioneer/Powell, a northern spur of the Oregon Trail known as Goodale's Cutoff, many small homesteads, irrigation canals, sheep and cattle camps, and stage and wagon trails. During World War II, the military used the central portion of the INL to test fire ordnance used by the Pacific Fleet and evidence of this era remain. Finally, many scientific and technical facilities have preserved important information on the historic development of nuclear science in America (DOE-ID, 2009).

The proposed ranges are intentionally located at or near previously disturbed sites to minimize further disturbance to the natural and cultural environment. Much of the proposed test locations (see Figure 2) have been subjected to disturbance, such as construction and demolition activities, gravel pits, roads and other infrastructure, or previous research activities; however, a portion of the area north of the TAN gravel pit is primarily undisturbed (see Figure 2).

# 4.0 ENVIRONMENTAL CONSEQUENCES

The following sections evaluate direct, indirect, and cumulative environmental impacts that are likely to occur from the alternatives described in Section 2. Section 4.1 discusses the environmental impacts associated with Alternative 1, with discussion on environmental impacts divided between the two sub-alternatives as described in Sections 2.3.1 and 2.3.2. Section 4.2 discusses the environmental impacts associated with 'no action.' Each section discusses cause and effect relationships, including cumulative impacts, of the proposed actions on INL's natural, biological, and cultural resources; mitigative measures needed to lessen impacts; and those permits and regulations required to protect the resources.

During the EA scoping meeting, resource personnel identified that air, water, biological, and cultural resources are most likely to be affected by the proposed actions. Therefore, the environmental consequences of those resource areas are the focus of this EA. The following sections discuss the environmental impacts of both alternatives on the above resources: Risk Analysis (air/water), Biological Resources, and Cultural/Historical Resources.

## 4.1 Alternative 1 – North and South Training Range

### 4.1.1 Risk Assessment

The risk assessment uses three environmental transport and dose assessment models to analyze dose to the public and employee from dispersed radioactive material. These models estimate transport and radiological dose from the atmospheric, surface, and groundwater pathways. Risk for this assessment is quantified in terms of radiological dose. Radiological dose is quantified in terms of the effective dose equivalent (EDE)[d] and includes the dose from external radiation and the 50-year committed dose from radionuclides ingested or inhaled. The EDE is the weighted sum of the dose equivalent to each organ of interest and has units of rem. The dose equivalent is the adsorbed dose (i.e., the energy imparted to tissue by ionizing radiation) to a given organ times a quality factor which is a measure of the relative biological effect of the radiation type.

This risk assessment evaluates the radiological doses to human associated with the use of dispersed radioactive materials for this training exercise. Atmospheric, surface, and groundwater pathway dose codes were used to calculate the EDE to hypothetical individuals for several exposure scenarios.

Interrogation activities such as a variety of high-energy techniques including X-ray, flash x-ray, portable isotopic neutron spectroscopy, and radiation generating devices would occur within the T-28 Gravel Pit and TAN/TSF area in the North Training area and the Radiological Work Area in the South Training Area when workers are present. Interrogation techniques such as these are already in use at INL location and would not result in additional risk to the environment or the worker. Worker exposure would be controlled in accordance with the radiological work permit (see glossary); there would be no exposure to the public from sealed radioactive sources, special form sealed radioactive sources, and contained (or unsealed) radioactive sources.

## Atmospheric Pathway:

This section discusses the methodology used to determine the EDE to the maximum exposed individual at the site boundary and to employees located at facilities near the training grounds. Refer to ECAR 1109 (2010) for details on methodology, source terms, and radionuclide specific information. Federal regulation 40 CFR 61 Subpart H establishes a dose limit to the public of 10 millirem/yr EDE from DOE activities. The estimated EDE to the public from the proposed work would be far below the allowed limit.

In accordance with Federal regulations 40 CFR 61 subpart H (*Radiological NESHAP*, see glossary), the atmospheric transport and radiological dose code, CAP88 PC Version 3 (EPA 2007), was used to calculate EDEs to a maximum exposed individual located at the nearest site boundary using the methodology described in the 2009 Radiological NESHAP report (DOE-ID 2010). EDEs were calculated by assuming the total releases from 12 exercises over a period of a year. EDEs were calculated for the maximum exposed individual at the site boundary (public) and for an employee located 1,384 meter from the North Training Range at TAN and 1,480 meter from the South Training Range at RWMC. These distances represent the distance to the nearest facility from the training grounds where a employee may potentially be exposed. In this document, EDEs to the maximum exposed individual at the site boundary and the employee are reported separately for the two proposed training ranges.

The EDE for the average annual release scenario[e] at the closest site boundary (EDE to the public) is 0.000588 millirem/year for the North Training Range (specifically the T-28 Gravel Pit), and 0.000706 millirem/year for the South Training Range (specifically, the radiological work area). Corresponding EDE values to the nearest site facility (EDE to the employee) is 0.0412 millirem/year for the North and 0.0365 for the South Training Ranges (see Table 3).

The maximum EDE to the public at the North Training Range location for the annual average release scenario is almost 17,000 times less than the 10 millirem/yr EDE limit (INL Administrative Control Level for the Public), and about 185 times less than the 10 millirem/yr EDE limit for the maximum release scenario. For the South Training Range location, the annual average release scenario is almost 14,000 times less than the 10 millirem/yr EDE limit and about 155 times less than the 10 millirem/yr EDE limit

d. Effective dose equivalent is expressed in units of rem/year.

e. Annual average release scenario assumes 8-hour release rate times 12 exercises per year.

for the maximum release scenario[f] (see Table 3). The maximum site boundary is located 12,522 meters northeast of TAN and 7,976 meters southwest of RWMC.

## Surface Pathway

The second model uses a surface pathway code (RESRAD Version 6.5) that computes the EDE if a person were to move on to the training range after 15 years of dispersing the radioactive material on the ground with the assumption that 12 exercises were performed each year. The person is assumed to grow vegetables, raise beef, and ingest milk from livestock feeding on the contaminated ground. Other exposure pathways include direct external exposure, soil ingestion, and inhalation of re-suspended soil surface particulates. The surface pathway model calculated an EDE of 0.000164 millirem/yr to a person (see Table 3).

## Groundwater Pathway:

The groundwater pathway methodology used a 2-step screening process: (1) Radionuclides with a half-life less than a year were eliminated from groundwater pathway assessment because of the length of time it takes to get to the groundwater, and (2) Radionuclides with a half-life greater than a year and were not noble gases were evaluated with the GWSCREEN (Rood 2003) model.

Federal and state drinking water regulations establish a radioactive dose limit of 4 millirem/yr dose equivalent from man-made radionuclides. This limit applies to public drinking water sources. For the purpose of this evaluation, it was assumed that a public drinking water well was located at the testing ranges; the nearest off-site, down-gradient public well is actually located near Arco. In accordance with Federal and State drinking water regulations, groundwater concentrations and ingestion doses are based on drinking 2 liters of water per day for 365 days per year and 12 exercises each year for 15 years. The resulting estimated doses are substantially below the Maximum Contaminant Level for Cl-36 of 700 picocuries/liter (EPA 2000). Groundwater ingestion EDEs are less than 0.0002 millirem/yr (see Table 3).

## Regulatory Requirements:[g]

INL conducts radiological operations in a manner that ensures the health and safety of all general employees, contractors, and the public. To achieve this objective, the INL ensures that radiation exposures to its employees and the public and releases of radioactivity to the environment are maintained below regulatory limits; in addition, deliberate efforts are taken to further reduce exposures and releases as low as reasonably achievable (ALARA).

The proposed activities at the RRTR create a potential for multiple types of exposure. The handling of activated KBr and the placement of sealed sources at the training range generates dose. Surface contamination and airborne radioactivity is generated by the distribution of the KBr solution over the designated fields at the training range.

The rules in 10 CFR 835, “Department of Energy (DOE) Occupational Radiation Protection,” establishes radiation protection standards, limits, and program requirements for protecting employees and the public from all ionizing radiation resulting from the conduct of DOE activities. The dose limit from DOE sources to employees is 5000 millirem per year (millirem/yr) EDE. 10 CFR 835 also establishes a dose limit for the public entering a controlled area at 100 millirem/yr EDE. DOE Order 5400.5, “Radiation Protection of the Public and the Environment,” also establishes a dose limit of 100 millirem/yr EDE for the public.

The ALARA process is an approach to radiological control to further reduce and control individual and collective radiation exposures through appropriate control of radioactive material, contamination, and airborne radioactivity. The purpose of the INL ALARA Program is to reduce and maintain radiation

f. Maximum release scenario assumes experiments are continuous for 24 hours per day, 365 days per year.

g. Non DOE regulatory requirements are discussed under Section 4.1 (‘Atmospheric Pathway’ and ‘Groundwater Pathway’).

exposures as far below the applicable controlling limits of 10 CFR 835 and the INL Radiological Control Manual (RCM) as is reasonably achievable. Therefore, laboratory management at INL has set an administrative control level for all activities to limit possible exposures to the public to 10% of the regulatory limit, which equates to 10 millirem per year. The INL administrative control level limit for possible exposures to employees is 14% of the regulatory limit, which equates to 700 millirem/yr.

## Putting Calculated Dose In Perspective:

The majority of radionuclides generated by the irradiated KBr have a short half-life and completely decay in about two weeks. The few remaining radionuclides with longer half-lives are at very low concentrations and have been modeled in extremely conservative environmental scenarios to determine the risk of exposure to employees and the public.

The sum of the atmospheric, surface, and groundwater models show the public dose would be about 0.01% of the INL Administrative Control Level for the Public. In addition, to put these doses in perspective, other radiation dose producing activities have been included in the table for comparison; for example, the average annual radiation dose to all of the U. S. general population from natural background radiation sources is approximately 310 millirem. (compare to ‘Regulatory Requirements’ and ‘Other Radiation Dose Producing Activities’ in Table 3.

Table 3. Regulatory Dose Requirements, Calculated Project Dose, and Perspectives.

| **Regulatory Requirements (Federal & INL)** | **Effective Dose Equivalent (EDE) (millirem/yr)** | |
|---|---|---|
| Federal Regulatory Limit for Public (40 CFR 61 subpart H) | 10 | |
| 40 CFR 141 Safe Drinking Water Act | 4 | |
| Federal Regulatory Limit for Employees (10 CFR 835) | 5000 | |
| INL Administrative Control Level for Employees | 700 | |
| Federal Regulatory Limit for the Public (10 CFR 835 & DOE 5400.5) | 100 | |
| INL Administrative Control Level for the Public | 10 | |
| | | |
| **Project Calculated Dose** | Average Annual Release Scenario | Maximum Release Scenario** |
| Atmospheric Pathway (Model 1 – **Public**) | | |
| Release to North Training Range | 0.000588 | 0.0537 |
| Release to South Training Range | 0.000706 | 0.0645 |
| Atmospheric Pathway (Model 1 – **Employee**) | | |
| Release to North Training Range | 0.0412 | 3.76 |
| Release to South Training Range | 0.0365 | 3.33 |
| Surface Pathway Model Ingestion Dose (Model 2) | 0.000164 | |
| Groundwater Pathway Model Ingestion Dose (Model 3) | 0.0002 | |
| | | |
| **Other Radiation Dose Producing Activities** | **Average Dose (millirem)** | |
| Dose to all US Population from *natural* background radioactive sources per year | 310 | |
| Airline Flight from New York to London | 4 | |
| 1 Abdominal X-Ray | 70 | |
| Mammography | 40 | |
| X-Ray Spine series | 500 | |
| Abdominal CT Scan | 800 | |

** The doses for this scenario assume KBr training is continuous over the year (i.e., 24-hours per day, 365 days per year). The total activity released in this scenario is 91 times the total activity released from the 12 releases expected for a year. The purpose of the scenario is to assure that it is not feasible to estimate a dose greater than 10 millirem/yr to the maximum exposed individual from operation of the KBr training facility.

### 4.1.2 Biological Resources

Potential impacts to vegetation communities, such as sensitive plant species and species of ethnobotanical (the plant lore and agricultural customs of a people) concern, associated with the proposed activity would be minimized by limiting the footprint of the disturbance, revegetating the areas that have been disturbed, and implementing a weed management plan. Revegetating with a diverse mix of native species similar in composition to the existing plant community may help maintain the diversity of those communities. Revegetation in sagebrush steppe is generally successful in only one of three years because of the variability in availability and the timing of precipitation.

Certain proposed activities would have unavoidable impacts to wildlife, such as: (1) loss of ground-dwelling wildlife species and associated habitat, (2) displacement of certain wildlife species due to increased habitat fragmentation, and (3) an increase in the potential for negative interaction between wildlife and humans (Blew et al. 2010). The control measures that would reduce the impact on wildlife include seasonal timing of activities, nesting bird surveys, and awareness programs.

Wildlife species of concern include sage-grouse, all migratory birds (including raptors), pygmy rabbits, Great Basin rattlesnakes, and all large mammal species (Blew et. al. 2010). Nesting bird surveys would be conducted before any soil or vegetation disturbance occurring between May 1 and September 1. No critical habitat for threatened or endangered species, as defined in the Endangered Species Act (ESA), exists on the INL Site. Sage-grouse is a Candidate Species for listing under ESA. It is likely that the proposed activity would have a direct impact on pygmy rabbits and indirect effects on sage-grouse, pygmy rabbits, or other sensitive species through habitat alteration (Blew et al. 2010). Impact from using interrogation devices (as described in Section 2 (Table 2) and Section 4.1 (under 'Risk Assessment') would not result in additional risk to biological resources.

#### *4.1.2.1 Alternative 1a 'Maximizing Project Flexibility'*

**<u>Sage-Grouse:</u>**

Surveys found suitable habitat for sage-grouse in the North and South Training Ranges. In the North Training Range sage-grouse habitat occurs along both sides of T-28 (North of the T-28 Gravel Pit). While the placement of command posts along the northern section of T-28 would remove vegetation, the impacts to sage-grouse and their habitat would be minimal due to the limited amount of disturbance (i.e., two 100-foot x100-foot areas for command posts) planned in the areas with habitat. Setting up and operating command posts may be disruptive to sage-grouse using the area along the road for rearing offspring. While placing command posts along the access road (South of the T-28 Gravel Pit) would not affect sage-grouse or their habitat, it could still disturb or destroy nesting migratory birds. At the South Training Range, project activities would be limited to the road and previously disturbed areas; therefore, training exercises conducted in that area would not impact sage-grouse habitat. Project personnel can minimize these impacts by limiting the disturbance footprint, implementing a weed management strategy to control invasive and noxious weeds, and following up with revegetation when the training ranges close. Any activity potentially disturbing vegetation or soils would require a nesting bird survey prior to disturbance.

**<u>Pygmy Rabbit:</u>**

Pygmy rabbit habitat occurs in the North and South Training Ranges. Surveys found extensive pygmy rabbit habitat and signs at the North Training Range, areas west of the gravel pit, and along both sides of the T-28 road (North of the T-28 Gravel Pit), as well as numerous locations containing actual sightings, burrow systems, and scat. Due to the mature stands of basin big sagebrush along the road and ample cover and forage as well as deep soils, this becomes an ideal setting for the rabbits. Any vegetation disturbance to this section of the project area would result in a direct loss of habitat for pygmy rabbits and possible loss of individuals as well. Setting up and operating command posts may be disruptive to pygmy rabbits using the area along the road. At the South Training Range, project activities would be limited to the road and previously disturbed areas; therefore, training exercises conducted in that area would not impact pygmy rabbit habitat.

### Habitat Fragmentation:

Nearly all of the sites where the proposed activities would remove habitat have been previously disturbed. The exception is the portion of T-28 road extending north from the T-28 gravel pit. Although this road already exerts some force on fragmentation, the loss of vegetation at multiple locations along that road would likely increase fragmentation of sage brush habitat. Project personnel can minimize these impacts by limiting the disturbance footprint, implementing a weed management strategy to control invasive and noxious weeds, and following up with revegetation when the training ranges close.

### Radiological Assessment:

Radiological impacts to plants and animals are unlikely due to the short radiological half-lives (most less than 24 hours) and low concentrations. In addition, the long-lived radionuclides in the dispersed radioactive material (Ar-39, Cl-36, and K-40) are naturally occurring in the environment (see Table 1), and the addition of the concentrations proposed are insignificant compared to those naturally occurring. Sealed radioactive sources, special form sealed radioactive sources, and the contained (or unsealed) radioactive sources would be in the area only when people are actively working; thus, lessening the opportunity of animals being present. However, to ascertain no impacts to animals and plants are occurring, a biota dose assessment would be conducted periodically as required by DOE Orders 450.1a (2008) and 5400.5 (1993) (see Table 2).

### Ecological Research and Monitoring:

Several long-term breeding bird surveys exist on the INL to help in monitoring breeding bird populations potential impacts of activities across the site. One of those routes travels along and through parts of the North Training Area (see Table 2). Limiting access to the large area at the North Training Range would adversely affect the continuity and utility of a long-term Breeding Bird Survey route. Coordinating timing of access to this route as an operational control would eliminate this impact. Continuation of the monitoring route would also provide information on the potential impacts the proposed action may have on local bird populations.

### Cumulative Effects:

The impacts associated with Alternative 1a have a small footprint, low intensity, and are near areas with much larger impacts to ecological resources. Operational controls described in Section 2 (Table 2) would help keep direct and indirect impacts to sage-grouse, pygmy rabbit, and migratory birds small. Placing command posts along the access road (North of the T-28 Gravel Pit) would remove less than 0.5 acres (2-100x100-foot areas along T-28) of sagebrush habitat, but could still disturb or destroy nesting migratory birds. Project personnel would minimize these impacts by limiting the disturbance footprint, implementing a weed management strategy to control invasive and noxious weeds, and follow up with revegetation when the training ranges close. Any activity potentially disturbing vegetation or soils would require a nesting bird survey before disturbance and if nesting migratory birds are found, no disturbance will be allowed during the nesting season. Therefore, while impacts and cumulative effects to those species and their habitat are not zero, they are likely low given that other habitat exists on the INL.

#### *4.1.2.2 Alternative 1b ‘Minimizing Project Impacts’*

Removing T-28 (North of the Gravel Pit) from consideration for command posts reduces the level of impacts to sage-grouse, pygmy rabbits, and habitat fragmentation. While some disruptive activities may still occur from traveling the road to place and detect radiological sources, those will likely be short-term. There would likely be no direct impacts to sage-grouse or pygmy rabbits or their habitat. While placing command posts along the access road (South of the T-28 Gravel Pit) would not affect sage-grouse or pygmy rabbits or their habitat, it could still disturb or destroy nesting migratory birds. Alternative 1b would continue to have similar potential for radiological impacts, and may limit access to ecological and monitoring activities. While placing command posts along the access road (South of the T-28 Gravel Pit) would not affect sage-grouse or their habitat, it could still disturb or destroy nesting migratory birds. Project personnel would minimize these impacts by limiting the disturbance footprint, implementing a weed management strategy to control invasive and noxious weeds, and following up with revegetation when the training ranges close. Any activity potentially disturbing vegetation or soils would require a nesting bird survey before disturbance and if nesting migratory birds are found, no disturbance will be allowed during the nesting season. At the South Training Range, project activities would be limited to the road and previously disturbed areas; therefore, training exercises conducted in that area would not impact sage-grouse or pygmy rabbit habitat.

**Regulatory Requirements:**

Soil and vegetation-disturbing activities, including those associated with mowing, blading, and grubbing, have the potential to increase noxious weeds and invasive plant species that would be managed according to 7 USC § 2814, "Management of Undesirable Plants on Federal Lands," and Executive Order 13112, "Invasive Species." INL would follow the applicable requirements to manage undesirable plants.

In analyzing the potential ecological impacts of the action alternative for this project, DOE-ID has followed the requirements of the Endangered Species Act (16 USC §1531 et seq.) and has reviewed the most current lists for threatened and endangered plant and animal species. Other federal laws that may apply include the Fish and Wildlife Coordination Act (16 USC § 661 et seq.), the Bald Eagle Protection Act (16 USC § 668), and the Migratory Bird Treaty Act (16 USC § 715–715s). If a species such as the sage-grouse or pygmy rabbit are listed before or during construction of the facility, DOE would initiate formal consultation with the U.S. Fish and Wildlife Service.

### 4.1.3 Cultural Resources

The proposed action described in alternative 1a or 1b would cause minor direct and indirect impacts on the cultural resources and archaeological sites at the North Training Range (near the T-28 gravel pit); impacts at the South Training Range (near RWMC) are unlikely. Impact from using interrogation devices (as described in Section 2 (Table 2) and Section 4.1 (under 'Risk Assessment') would not result in additional risk to cultural resources.

#### *4.1.3.1 Alternative 1a 'Maximizing Project Flexibility'*

The North Training Range is located within the Birch Creek Sinks where several historic channels of Birch Creek traverse the project area. The proposed project area is also adjacent to the historic shoreline of Pleistocene Lake Terreton. Given these factors and based on observations from past archaeological surveys, it has been determined that the area within and surrounding the North Training Range is highly sensitive archaeologically, except for the TAN/TSF and parking lot areas. Anticipated prehistoric archaeological resources could range from 13,500-year-old hunting camps to historic agricultural activities dating from 60 to 150 years.

Due to the nature and extent of cultural resources already identified that may be directly and indirectly impacted by project activities within the defined areas of potential effect, cultural surveys would be required before starting any soil disturbing activities. INL's Cultural Resource Management Office would assess all newly recorded resources for eligibility to the National Register of Historic Places and for project effects (impacts to cultural or historic resources) in consultation with the Idaho State Historic Preservation Office and Shoshone-Bannock Tribes.

In addition, archaeological sites and Native American resources identified within the project area would also be subject to indirect impacts during project activities because of higher visibility on the landscape and overall increases in human activity levels in an area that has previously been somewhat remote. Artifacts may be subject to unauthorized collection or affected by unauthorized off-road vehicle use. Resident and migratory birds and animals of importance to the Shoshone-Bannock Tribes may be disturbed and noxious and invasive weeds may increase, to the detriment of native plant species with tribal value.

Three previous cultural resource investigations have been conducted in the general vicinities of the project areas under consideration for the RRTR; two in the T-28 gravel pit area (Miller 1985; Ross et al. 1986) and one at the South Training Range (INL CRMO Project Files: BEA-08-26). The two previous surveys conducted within the North Training Range identified eight prehistoric sites and four isolated finds within the administrative boundaries of the T-28 gravel pit; however, these past surveys are older than ten years. As such, Cultural Resource personnel would need to conduct new surveys in the area and along T-28 as described in Table 2. Preliminary investigations have shown extensive prehistoric land use dating to 11,000 years before present.

Cultural resource personnel previously surveyed the TAN/TSF, TAN parking lot, and the areas consisting of the South Training Range; therefore, no further cultural surveys would need to be conducted at those areas, unless soil disturbance uncovers items of interest.

Project activities would include operational controls before and during project activities to minimize the potential for adverse direct and indirect impacts to cultural resources using a tiered approach with initial efforts focusing on identification and assessment, followed by various protection strategies as discussed in Table 2. While there is the potential for cumulative impacts to cultural resources, operational controls, as described in the document would avoid adverse impact.

#### *4.1.3.2 Alternative 1b 'Minimizing Project Impacts'*

Alternative 1b has the same impacts as Alternative 1a, with the exception that removing the placement of command posts along the northern portion of the T-28 road (north of the Gravel Pit) reduces the level of impacts to cultural resources in this sensitive area. While disruptive activities may still occur along this portion of roadway from traffic along the road and walking out into the sage brush to place and detect radiological sources, those would likely be minimal.  Project personnel would follow the operational controls outlined in Table 2 to avoid adverse impacts to cultural resources. Mowing would not be required along the T-28 road (north of the gravel pit) to protect from wildfires.

**Regulatory Requirements:**

A variety of laws, regulations, and statutes manage or protect cultural resources. Such resources include buildings, sites, structures, or objects; each of which may have historical, architectural, archaeological, cultural, and scientific importance. Most of these requirements have been tailored to the unique needs of the INL through Programmatic Agreement between DOE-ID, the Idaho SHPO, and the Advisory Council on Historic Preservation. The requirements include:

- Antiquities Act of 1906 (Public Law 59-209)
- Reservoir Salvage Act of 1960 (Public Law 86-523)
- National Historic Preservation Act of 1966 (Public Law 89-665); Section 106 of this act and its implementing procedures require federal agencies to take into account the potential effects of proposed projects on historic properties listed on or potentially eligible for listing on the National Register of Historic Places
- National Environmental Policy Act of 1969 (42 USC § 4321 et seq.)
- Protection and Enhancement of the Cultural Environment (Executive Order 11593)
- Archaeological and Historic Preservation Act of 1974 (Public Law 93-291)
- Archaeological Resources Protection Act of 1979 (Public Law 96-95)
- Native American Graves Protection and Repatriation Act of 1990 (43 CFR 10).

### 4.1.4 Other Resources

Section 4.1.1, 'Risk Assessment,' considers the potential impacts to air, soil, and water resources (groundwater). This section briefly discusses potential impacts from greenhouse gas (GHG) emissions and climate change. Currently, INL estimates its contribution of GHG emissions to be about 100,000 metric tons annually. Those INL activities contributing to this value include purchased electricity (~65,000 Metric Ton $CO_2$-equivalent), stationary combustion (gas boilers, non-emergency diesel generators) (~15,000 Metric Ton $CO_2$-equivalent), and mobile combustion (car and bus fleet) (~10,000 Metric Ton $CO_2$-equivalent). Project activities that would contribute to the GHG emissions include the use of light-duty vehicles, air transportation (fixed wing and helicopters), and portable generators. The intermittent use of ground and air transportation and use of generators during project activities (up to 12 exercises per year) is likely an insignificant portion of INL's total GHG emissions.

## 4.2 Alternative 2 – No Action

The no action alternative means that none of the actions described in Alternatives 1a or 1b would occur at any of the locations. DOE would have to turn to other locations across the complex to meet the purpose and need described in Section 1. Environmental impacts, as described in Section 4, would not occur on the INL from actions described in this document. However, as with Alternative 1 or 2, DOE would continue to mine the T-28 gravel pit, clean up the TAN/TSF, and use the South Training Range for other purposes.

## 4.3 Summary of Proposed Impacts

Following is a summary of proposed impacts:  Risk Assessment (air and water resources), Biological Resources, Cultural Resources, and Cumulative Impacts.

**Risk Assessment:**

The sum of the atmospheric, surface, and groundwater models show the public dose would be about 0.01% of the INL Administrative Control Level for the Public (see Table 3). These small doses would not produce any adverse impacts.  In addition, the risk to workers would be managed and mitigated in accordance with the INL Radiation Protection Program.

**Biological Resources:**

The proposed actions described in Alternative 1a would likely impact some wildlife species by removing sage-grouse and pygmy rabbit habitat and causing disruptive activities along T-28. In addition, the disruptive behavior would magnify the habitat fragmentation already caused by the road and its use. Those activities described in Alternative 1b would have no or minimal impact on sage-grouse and pygmy rabbits along T-28, and would likely not contribute to any habitat fragmentation. Proposed operational controls would lessen impacts to these resources for both Alternatives 1a and 1b.

**Cultural Resources:**

The proposed action in Alternative 1a or 1b would cause minor direct and indirect impacts on the cultural resources and archaeological sites at the North Training Range (near the T-28 gravel pit); impacts at the South Training Range (near RWMC) are unlikely. To minimize potential impacts, project personnel would work with Cultural Resource personnel to complete required archaeological surveys, and locate areas along the south access road and around the T-28 gravel pit to place command posts and to avoid sensitive cultural resources.

**Cumulative Impacts:**

Project activities have the potential to affect cultural and biological resources by their activities, which includes traveling T-road, removing vegetation and disturbing soil, flying over the sites, and other disruptive activities. However, from a cumulative impact perspective, the incremental amount is likely not significant. The North and South Range are within 1 to 2 miles of INL facilities (SMC, TAN, and RWMC), situated along T-roads (which are traveled by security and other site personnel), and make up a small percentage of the total area of INL. The RRTR (both North and South) would use about 900 acres out of 569,600 acres, or less than 0.2% of INL land. The primary training area in the North Training Range is an operating gravel pit. Considering the widely spread nature of INL facilities and that most of the site remains pristine, the cumulative impact of the training ranges is likely small. Cumulative impacts to cultural artifacts, sage-grouse, pygmy rabbits, and other resources is low.

# 5.0 COORDINATION AND CONSULTATION

## U. S. Army Corp of Engineers:

DOE contacted the U.S. Army Corp of Engineers, Idaho Falls, ID Regulatory Field Office, on June 15, 2010, to discuss the proposed establishment of the Radiological Response Training Range and the use of the two 'training ranges' on the INL: North Training Range and South Training Range (see Figure 2). The potential activities would not be subject to Section 404 Clean Water Act (see glossary) permit requirements administered by the U.S. Army Corps of Engineers as they would not result in discharges of dredged or fill material into waters of the U. S.

## Idaho State Historic Preservation Office, the Advisory Council on Historic Preservation, and the Shoshone-Bannock Tribes:

In 2004, DOE-ID entered into a programmatic agreement with the Idaho State Historic Preservation Office and the Advisory Council on Historic Preservation. The agreement legitimizes the INL Cultural Resource Management Plan (DOE-ID 2009), by which INL complies with Section 106 of the National Historic Preservation Act and its implementing regulations (36 CFR 800), as well as various other sections of the National Historic Preservation Act and cultural resource laws to meet the unique needs of the INL Site. DOE-ID's "Agreement in Principle" with the Shoshone-Bannock Tribes ensures an active tribal role in cultural resource impact assessment and protection. INL would continue to comply with the National Historic Preservation Act, Section 106, through the INL Cultural Resource Management Plan, and the plan would be used to develop a strategy to protect cultural resources from adverse impact. A cultural resource protection plan would be developed for the RRTR project in consultation with the Idaho State Historic Preservation Office and Shoshone-Bannock Tribes.

## Shoshone-Bannock Tribal Briefing:

On July 7, 2010, the Department of Energy-Idaho Operations Office (DOE-ID) provided a detailed technical briefing on the Radiological Response Training Range (RRTR) project to the Fort Hall Business Council (FHBC) of the Shoshone-Bannock Tribes. This discussion talked about the scope of the activity, potential locations, and the need for this capability. It was discussed, and the FHBC recognized, that the Tribes' Cultural Resource personnel (Heritage Tribal Office) have worked with DOE-ID and BEA to assess impacts on cultural resources at the project sites. The land area for INL is within the Shoshone-Bannock Tribes' ancestral and aboriginal homeland. Therefore, they proclaim a vested interest in all activities at INL. DOE-ID has negotiated a series of Agreements in Principle that acknowledge the Tribes' interests and connectivity to this area and recognizes the viability of their 1868 Fort Bridger Treaty as a law of the land that establishes their sovereignty. The FHBC recognized the critical nature of this and any future related projects that support National Defense and Homeland Security and serve to protect the United States of America. The FHBC provides a consensual blessing and wishes that their support be acknowledged because of their spiritual and ancestral connection to this land. They support the project and the use of the land for these purposes, and wish to be considered as a helping partner and have these interests expressed to those who would use the RRTR and be trained. This briefing with the Tribes did not constitute formal government-to-government consultation.

# 6.0 REFERENCES


10 CFR Part 835, “Department of Energy Occupational Radiation Protection,” *Code of Federal Regulations,* Office of the Federal Register.

10 CFR Part 1021, “DOE NEPA Implementing Regulations,” *Code of Federal Regulations*, Office of the Federal Register.

36 CFR 800, 2004, “Protection of Historic Properties,” *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 61, “National Emission Standards For Hazardous Air Pollutants”, *Code of Federal Regulations*, Office of the Federal Register.

40 CFR Parts 1500-1508, “CEQ Regulations for Implementing NEPA,” *Code of Federal Regulations*, Office of the Federal Register.

43 CFR 10, 2010, “Native American Graves Protection and Repatriation Regulations,” *Code of Federal Regulations*, Office of the Federal Register.

7 USC § 2814, 2006, “Management of Undesirable Plants on Federal Lands,” *United States Code*.

16 USC § 661 et seq., 1960, “Fish and Wildlife Coordination Act,” *United States Code*.

16 USC § 668, 1940, “Bald Eagle Protection Act,” *United States Code*.

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16 USC § 1531 et seq., 1973, “Endangered Species Act,” *United States Code*.

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Public Law 93-291, 1976, “Archaeological and Historic Preservation Act of 1974,” as amended, as promulgated in 16 USC 469–469c.

Public Law 96-95, “Archaeological Resources Protection Act of 1979,” as amended, as promulgated in 16 USC 470aa-mm.

Public Law 107-296, 2002, “Homeland Security Act of 2002.”

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