Department of Energy
Idaho Operations Office
1955 Fremont Avenue
Idaho Falls, ID 83415

May 13, 2010

SUBJECT: Release of the Draft Environmental Assessment for the Multipurpose Haul Road Within the Idaho National Laboratory Site (EM-FMDP-10-043)

Dear Citizen:

Thank you for your interest in the Draft Environmental Assessment (EA) for the Multipurpose Haul Road Within the Idaho National Laboratory Site (enclosed).

Your comments on this project and the potential environmental impacts are important to us. Please submit your comments either by e-mail to perryjn@id.doe.gov, or by mail to Jeff Perry, 1955 Fremont Ave. MS 1222, Idaho Falls, ID 83415-1222. The environmental assessment can be accessed on the DOE website at www.id.doe.gov. Comments must be received or postmarked by June 2, 2010.

All comments will be addressed in a Response to Comment section of a final EA that will be released in June 2010. At that time, either a Finding of No Significant Impact (FONSI) or a determination that an Environmental Impact Statement for the proposed action will be issued.

Again, thank you for your interest in this important endeavor.

Sincerely,

M. Christine Ott for
Dennis M. Miotla
Interim Manager

Enclosure

DOE/EA-1772

Draft Environmental Assessment for the Multipurpose Haul Road Within the Idaho National Laboratory Site

May 2010

DOE/EA-1772

Draft Environmental Assessment for the Multipurpose Haul Road Within the Idaho National Laboratory Site

May 2010

CONTENTS

FIGURES

TABLES

ACRONYMS

ATR Complex	Advanced Test Reactor Complex
BP	before present
CFR	Code of Federal Regulations
DOE	Department of Energy
DOE-ID	U.S. Department of Energy Idaho Operations Office
DOT	Department of Transportation
EA	environmental assessment
EDF	engineering design file
EM	Environmental Management
ESER	Environmental Surveillance, Education and Research
INL	Idaho National Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
MFC	Materials and Fuels Complex
NERP	National Environmental Research Park
NRC	Nuclear Regulatory Commission
PM	particulate matter
R&D	research and development

GLOSSARY

Detect. To discover the existence or presence of something.

Ethnobotany. The study of plants as they pertain to an indigenous culture.

Ethnoecology. The study of the natural environment as it pertains to an indigenous culture.

Experiment materials. For the purposes of this environmental assessment, experiment materials are various items, components, and packages that, for research and development purposes, are irradiated in the Advanced Test Reactor and transported to Materials and Fuels Complex facilities for post-irradiation examination. Some experiment materials are returned to the Advanced Test Reactor following examination.

Fuel (fuel transfers). For the purpose of this environmental assessment, fuel transfers are the movement of spent nuclear fuel from storage at Idaho Nuclear Technology and Engineering Center facilities or other Idaho National Laboratory Site facilities to reprocessing facilities at the Materials and Fuels Complex.

Habitat fragmentation. A splitting of contiguous areas into smaller and increasingly dispersed fragments.

Hibernacula. Protective structure in which an organism remains dormant for the winter.

Lek. An area where male grouse congregate for breeding purposes.

Loess. Soil material transported and deposited by wind and consisting of predominantly silt-sized particles.

Non-game species. Animals that are not normally hunted, fished, or trapped.

Out-of-commerce. Transportation on (across or along) a government-controlled road where access by the general public is restricted through the use of gates and guards.

Sagebrush obligate species. A species that is able to exist or survive only in sagebrush habitat.

Spent nuclear fuel. Fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing.

Special nuclear material. Plutonium, uranium-233, uranium enriched in the isotope-235, and any other material, which pursuant to 42 USC 2071 (Section 51, as amended, of the Atomic Energy Act of 1954) has been determined to be special nuclear material. The Department of Energy has determined that both Np-237, and Pu-238, would be managed with the same level of security as special nuclear materials (DOE M 474.1.1B, "Manual for Control and Accountability of Nuclear Materials").

Sympatric. Species or other taxa with ranges that overlap.

Waste. Nuclear material residues that have been determined to be uneconomical to recover.

Wilding. Individual plants that are removed from nearby natural communities and immediately transplanted onto a disturbed site.

Draft Environmental Assessment for the Multipurpose Haul Road Within the Idaho National Laboratory Site

1. PURPOSE AND NEED

The U.S. Department of Energy (DOE) proposes to provide an alternative route, other than the public highway, to transport several thousand shipments of materials and wastes expected over the next 10 years (Engineering Design File [EDF] -9513) between the Materials and Fuels Complex (MFC) and other Idaho National Laboratory (INL) Site facilities. The proposed action is needed to reduce shipment costs, improve operational efficiency, improve highway safety, and reduce impacts to the public by minimizing road closures. Currently, shipments are via public U.S. Highway 20, requiring that the public be restricted from access to the highway during shipping periods. An internal road would allow shipments between facilities without impacting public access to the public highway. The cost and time required for notifications, road closures, and shipping container certification is considerable when using the public highway, decreasing operational efficiency.

DOE is proposing to construct a road for limited year-round use with the ability for trucks traveling in opposite directions to pass. The analysis of the proposed road evaluates clearing and grading a base, installing necessary culverts and drainage, and placing and compacting gravel for the roadway. The haul road would be used to:

- Transport spent fuel
- Transport special nuclear material
- Accommodate research fuel transfers
- Transport testing or experiment materials
- Transport wastes.

1.1 Background

Within DOE, the mission of the Office of Nuclear Energy is to promote nuclear power as a resource capable of meeting the nation's energy, environmental, and national security needs by resolving technical and regulatory barriers through research, development, and demonstration (DOE 2010a). The Office of Nuclear Energy is meeting these needs through many programs, and executes landlord responsibilities for the INL Site in a manner designed to ensure the safety, operability, security, and environmental compliance of the Idaho Falls facilities, and makes them available to researchers from government, industry, and academia (DOE 2010b). Among the research and development (R&D) activities conducted at the INL Site are those that are designed to foster collaborative R&D with international partners in advanced nuclear energy systems (DOE 2010c).

INL’s strategic plan, endorsed by DOE, is to create a technically achievable, economically competitive, and environmentally sustainable nuclear energy option for the nation that is worthy of public confidence and trust. Critical to this strategic plan are extensive collaborations with the world's premier academic, government, and industrial nuclear science and technology organizations; state of the art research facilities; and support infrastructure and management systems that are available to the international community (INL 2010).

INL's nuclear energy R&D capabilities are centered on two campuses located on the INL's 890-square-mile site: the Advanced Test Reactor Complex (ATR Complex) and MFC. The ATR Complex is located approximately 20 miles from MFC. The INL must be able to efficiently transfer nuclear materials and fuels between ATR Complex and other facilities and MFC for R&D purposes. The R&D activities conducted at INL are expected to continue for the foreseeable future, at least 30 to 40 years, and materials and fuels are anticipated to be transferred between facilities throughout that period.

The DOE Office of Environmental Management (EM) mission is to complete the safe cleanup of the environmental legacy brought about from five decades of nuclear weapons development and government-sponsored nuclear energy research. The EM program has made considerable progress in shifting away from risk management to embracing a mission completion philosophy based on reducing risk and reducing environmental liability. The EM mission at the INL Site is focused on securing and storing nuclear material in a stable, safe configuration in secure locations to protect national security; transporting and disposing of transuranic and low-level wastes in a safe and cost effective manner to reduce risk; and decontaminating and decommissioning facilities that provide no further value to reduce long-term liabilities and maximize resources for cleanup. A multipurpose haul road would facilitate completion of the EM mission by allowing transportation of nuclear materials, waste, and decontamination and decommissioning debris between MFC and other locations on the INL Site. Table 1 reflects approximately 10,000 – 18,000 shipments that would require U.S. Highway 20 road closure over the next 40 years.

Table 1. Transportation needs assessment between MFC and the balance of the INL.

Materials	Quantity	Transporter Type	Approximate Weight	Special Requirements	Shipment Confidence
EBR-II Fuel Transfers	230 shipments (2012-2017)	HFEF-6 cask (preferred)	80,000 lb	Road Closure	High
SNM Consolidation (2012-2015)	200 shipments (2/month for 30 years)	Casks on semi trucks Potentially SSTs	Less than 80,000 lb	Road Closure	Medium
RH LLW (sodium and TRU)	300-350 shipments (2010-2020)	4-packs and FTC on tractor trailer	80,000 lb	Road Closure	High
Newly generated	100 to 300 shipments (30 years)	4-packs on tractor trailer	80,000 lb	Road Closure	High
ATR – PIE & Return	480 shipments (6 each way/year for 40 years)	GE-2000	Less than 80,000 lb	None	High
Pu – 238 Production-related	700 shipments (10 each way/ year for 35 years)	DOT 9975 DOT 5320 GE-2000 potentially SSTs	Less than 80,000 lb	Road Closure	Medium
R&D-related Shipments of SNM	8,000 - 16,000 shipments (100-200 annually each way between MFC and INTEC for 40 years)	Casks on semi trucks potentially SSTs	Less than 80,000 lb	Road Closure	Medium

Materials	Quantity	Transporter Type	Approximate Weight	Special Requirements	Shipment Confidence
MFC D&D Debris	700 shipments (2010 – 2012)	Dump trucks and semi trucks with cargo containers	Less than 80,000 lb	None	High

SNM – Special Nuclear Material; RH LLW – Remote Handled Low Level Waste; TRU – Transuranic waste; ATR- Advanced Test Reactor; PIE – Post-Irradiation Experiment

1.2 Environmental Assessment Requirements

This environmental assessment (EA) was prepared in accordance with the following requirements:

- National Environmental Policy Act of 1969 (Public Law 91-190; 42 USC § 4321 et seq.), as amended
- Council on Environmental Quality National Environmental Policy Act Regulations (Title 40 Code of Federal Regulations [CFR], Parts 1500–1508)
- DOE National Environmental Policy Act Implementing Regulations (10 CFR 1021)
- DOE Order 451.1B, "National Environmental Policy Act Compliance Program."

This EA would serve as the basis for the determination to issue a finding of no significant impact or to prepare an environmental impact statement.

2. PROPOSED ACTION AND ALTERNATIVES

DOE developed selection criteria to determine potential alternatives that would meet its purpose and need identified in Section 1. The following is a list of those selection criteria:

- The alternative must provide ability to transport out-of-commerce shipments to reduce mission impacts caused by highway closures
- The alternative must provide a location and route that supports a road design and construction for the size, weight, and vehicle characteristics required for foreseeable shipments
- The alternative must not unacceptably impact other INL Site programmatic or operational activities
- The alternative must be located far enough from U.S. Highway 20 to preclude public access to the shipments.

Precluding public access is one of several methods used by DOE to provide safety that is equivalent to that which would be provided by use of a licensed cask.

The listed criteria provided the basis for determining the alternatives considered and analyzed, which are:

Alternative 1—New route south of the T-25 utilizing the existing road to the extent possible (Preferred Alternative)

Alternative 2—T-24 road upgrade.

The No Action Alternative and four additional alternatives are discussed in this section. The four additional alternatives were considered, but eliminated from detailed analysis.

2.1 Description of Proposed Action

Currently, materials are transported between MFC and the balance of the INL Site over U.S. Highway 20, either in full compliance with Department of Transportation (DOT) regulations or in "out-of-commerce" shipments when full compliance with DOT regulations cannot be achieved. Out-of-commerce shipments must be planned and executed in a manner that provides a degree of safety at least equivalent to shipment under DOT regulations and require that the highway be closed to public traffic during shipment. DOT-compliant shipments often require multiple transfers of the material between DOT-approved shipping containers and specialized INL containers that facilitate moving the material into facilities for examination. Although these INL containers are safe for transporting the material, they have not been tested and licensed by the Nuclear Regulatory Commission (NRC) for transportation on public highways. When the INL containers are used for out-of-commerce shipments, it is customary to notify the Idaho Department of Transportation. Several contractor organizations are involved in planning the shipment and closing the road. Shipment schedules are designed to minimize inconvenience to the public, often occurring in the middle of the night, which is not always supportive of INL's need.

To meet INL's need for efficient, cost-effective, flexible transport of materials, a nonpublic road between MFC and existing INL Site nonpublic roads is proposed. A nonpublic road, entirely within the INL Site, would provide efficient, cost-effective transport by:

- Allowing use of specialized INL containers that would not require NRC or DOT licensing, which is a costly and lengthy process and may not satisfy critical programmatic schedule needs; use of the specialized INL containers eliminates the requirement to transfer materials into and out of NRC-or-DOT-approved containers

- Enhancing public safety by eliminating thousands of shipments from public roads
- Eliminating extended closure of the public road in the event of an accident
- Minimizing external constraints that impact the costs and schedules of projects.

The existing available roads include T-3, T-24, and T-25. T-3 and T-24 are very primitive two-track roads and would not support transport vehicles of the size required. Using an existing site road, without upgrading it, is not acceptable for safety reasons due to uneven surfaces affecting load stability, power line clearance, tight turning radius, dramatic vertical curvature that could tip or high-center the load, and unstable or soft spots that could tip the load.

Establishing an upgraded site road to support the required transport vehicles is the only option that meets the on-Site transportation needs and avoids closure of U.S. Highway 20. The upgraded road would satisfy the requirements for the majority of the required shipments with a design capacity for a 100,000-lb gross vehicle weight, double-drop, three-axle trailer with 6-inch ground clearance (EDF-9513). Shipments exceeding that limit may have to use U.S. Highway 20. A few such unusual shipments on U.S. Highway 20, with the associated road closures, are assumed to be acceptable without substantial project impacts, costs, and inconvenience to the public.

The internal road would be a controlled access road for maintenance and out-of-commerce shipments only. Design would be for maximum speed of 35 miles per hour (EDF-9513) with the ability for oncoming trucks to pass, accommodated either by road width or turnouts at appropriate intervals.

The Monroe Gravel Pit near the ATR-Complex would be used to provide gravel for the road base. The existing pit would require expansion. The expansion was addressed in the *Idaho High-Level Waste & Facilities Disposition Final Environmental Impact Statement* (DOE 2002). Prior to expansion, all necessary cultural resource and ecological clearances would be obtained.

2.2 Alternatives

2.2.1 Alternative 1—New Route South of T-25 Utilizing the Existing Road to the Extent Possible (Preferred Alternative)

The route proposed for the Preferred Alternative, Alternative 1, would travel south of the T-25 power line maintenance road and be approximately 13 miles long. The route from INTEC to MFC would be the following: travel Lincoln Boulevard south to Central Facilities Area, take East Portland Avenue to Jefferson Boulevard[a], travel north along Jefferson Boulevard, turn east on Wilson Boulevard, travel Wilson Boulevard to Fillmore, then north to T-25, and continue along a corridor south of the existing T-25 east to MFC (see Figure 1).

Lincoln Boulevard, Portland Avenue, and Jefferson Boulevard are existing, paved, maintained roads. Wilson Boulevard is a paved road but is currently classified as inactive and, therefore, is not maintained. The pavement on Wilson Boulevard (approximately 2.10 miles) is breaking up and is in poor condition. The pavement would break up under heavy use and would require regrading of the road and shoulder areas at some point.

T-25 is a power line service road. It is currently used to maintain the power line, as well as for security, fire protection, and ecological studies, etc. The first 4 miles on the western approach of the road

---

a. This portion of the route is the same for Alternative 1, 2 and the No Action Alternative.

has been improved and is passable in the summer by larger trucks but is too soft for travel in the winter. The remainder of the road is a two-track road accessed by four-wheel-drive vehicles for power line maintenance and fire protection. The road has rock outcroppings, with soft sand or silt material in low spots. Following recent range fires, sand has blown into many of the low areas, creating soft conditions that make travel difficult.

The Preferred Alternative route would follow the T-25 corridor, but rather than follow the existing T-25 road, which weaves back and forth under the power line, the proposed road would stay south of the power line, avoiding the power line and the buried fiber optic cable just north of the power line.

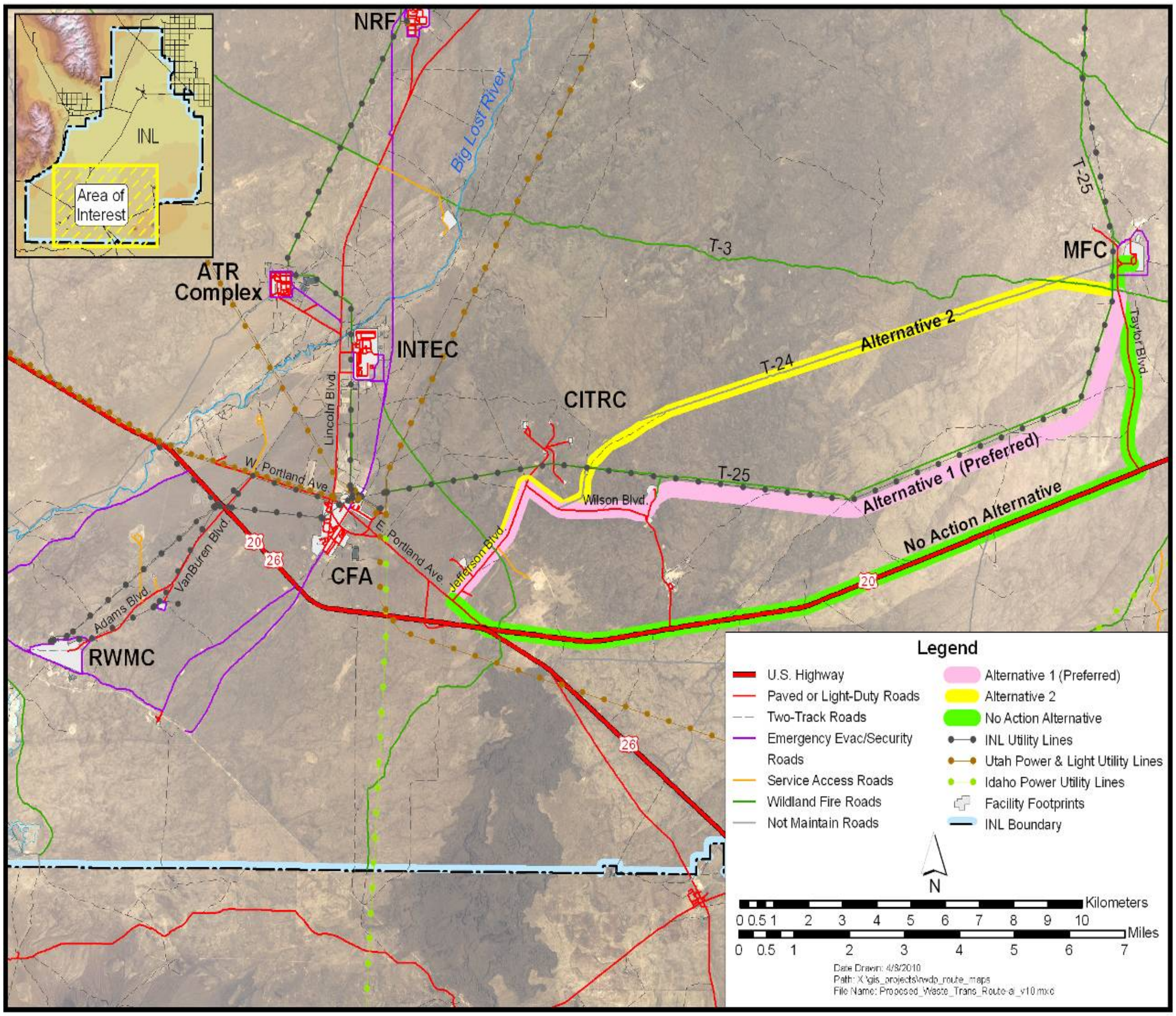

Figure 1. Alternative transportation routes from the Idaho Nuclear Technology and Engineering Center to the Materials and Fuels Complex.

2.2.2 Alternative 2—T-24 Road Upgrade

The T-24 route is an inactive road approximately 12 miles long consisting of a two-track, four-wheel-drive trail described as very rough. The route of T-24 from INTEC would travel along Lincoln Boulevard south to the Central Facilities Area, take East Portland Avenue to Jefferson Boulevard[b], travel north along Jefferson Boulevard, turn east on Wilson Boulevard, travel Wilson Boulevard to the Critical Infrastructure Test Range Complex perimeter fence and road north to T-24, and continue along T-24 east to MFC (see Figure 1). Wilson Boulevard would require regrading (approximately 0.66 mile) as described in Section 2.2.1.

A new section of road must be constructed along the T-24 route. Considerable rock removal, cutting, filling, compaction, and grading are required on this route. Alternative 2 minimizes the length of the impacted area and construction (12 miles versus 13 miles for Alternative 1). This route uses a perimeter road around the Critical Infrastructure Test Range Complex.

2.3 Alternatives Considered, but Eliminated from Detailed Analysis

2.3.1 T-3 Upgrade

T-3 was originally a stagecoach and freighting route in the late 1800s. T-3 is a two-track road that runs between Lincoln Boulevard (north of INTEC) and MFC. The route is approximately 15 miles long. The route runs north from INTEC along Lincoln Boulevard, turns east on T-3, crosses the Big Lost River, and continues to MFC. This historic trail winds through several lava fields and is marked by dozens of rock cairns along its route that were probably used as guides during winter months when the road was covered with deep snow and sleighs were used instead of wagons. This route is mostly rock and would require rerouting to straighten out sharp curves. Considerable rock removal, cutting, filling, compaction, and grading would be required for this route.

T-3 was evaluated in the *Draft Environmental Impact Statement for the Proposed Consolidation of Nuclear Operations Related to Production of Radioisotope Power* (DOE 2005). T-3 is a historic stagecoach trail and is also known as the Lost River/Arco Road. The route was proposed to be used to transport unirradiated and irradiated targets between INL Site facilities; however, it was eliminated due to its historical importance and because it crosses the Big Lost River, requiring a bridge that would impact the floodplain and wetlands along the Big Lost River (DOE 2005, Section 2.2.4.3).

2.3.2 New Road Adjacent to the North Side of U.S. Highway 20

DOE considered a route on the north side of U.S. Highway 20. However, this route was eliminated from further analysis because it would be too close to the public highway and would not provide sufficient public setback distance needed for equivalent public safety. A new road adjacent to the north side of U.S. Highway 20 fails to meet the following criteria:

- The alternative must provide ability to transport out-of-commerce shipments to reduce mission impacts caused by highway closures
- The alternative must be located far enough from U.S. Highway 20 to preclude public access to the shipment.

---

b. This portion of the route is the same for Alternative 1, 2, and the No Action Alternative.

2.3.3 T-25 Upgrade to Accommodate a Heavy Hauler

T-25 is a power line maintenance road that DOE considered and eliminated from analysis. The condition of T-25 is described in Section 2.2.1 (see Figure 1). The T-25 upgrade to accommodate a heavy hauler fails to meet the following criterion:

- The alternative must provide a location and route that supports a road design and construction for the size, weight, and vehicle characteristics required for foreseeable shipments.

With some maintenance, T-25 has been used seasonally to support emergency and security vehicles. T-25 runs along the power line and crosses under the power line many times. In some places, the road runs directly beneath the support cables used to stabilize the power line. Some vehicles with off-road capability would be able to use the general path, but the road would not support all the necessary transport vehicles without upgrade or modification. The upgrades would include leveling out areas where the road grade is too steep to accommodate the shipping trailers and rerouting to ensure shipments would clear the power lines and support cables. In addition, to support the height and weight of some shipments, the existing road may need widening.

2.3.4 U.S. Highway 20 with Fillmore Turnoff

Continued use of U.S. Highway 20 with Fillmore turnoff was a route DOE considered and eliminated from analysis. This route would turn off U.S. Highway 20 to Fillmore, turn west on Wilson to Jefferson, and proceed to E. Portland Avenue (see Figure 1). The Fillmore road has not been maintained for many years. Therefore, the pavement would break up under heavy use and would eventually require resurfacing, such as regrading.

The route would require the same road closures as the No Action Alternative, but would be a shorter traveling distance (see Figure 1). The U.S. Highway 20 with Fillmore Turnoff Alternative fails to meet the following criteria:

- The alternative must provide ability to transport out-of-commerce shipments to reduce mission impacts caused by highway closures
- The alternative must be located far enough from U.S. Highway 20 to preclude public access to the shipment.

2.4 No Action Alternative

2.4.1 Continue Use of U.S. Highway 20

The No Action Alternative would continue to use existing U.S. Highway 20. Each road closure of the 13-mile section of U.S. Highway 20 between MFC and the main gate is typically conducted between about 11 p.m. and 2 a.m. to minimize impacts to the public. However, program and project impacts of the No Action Alternative increase costs and complexity: Personnel working on the various Spent Nuclear Fuel and Special Nuclear Material R&D projects and programs would be required to work overtime, during off hours, to conduct the shipments, resulting in extra project and program costs and loss of their availability to support research during normal working hours. Alternatively, additional staffing would be required to support off hours transportation needs while still meeting routine needs during normal working hours. Ensuring the availability of appropriate R&D staff at multiple facilities to allow coordination of R&D activities with the transportation activities would require increased staff or significant overtime for staff, raising project and program costs. Additional transportation personnel would be needed to conduct off hour activities.

Currently all shipments of material between MFC and other parts of the site are moved down U.S. Highway 20, under requirements equivalent to DOT requirements but the road has to be closed when the shipping packages do not meet all DOT requirements for shipping in the public domain, (i.e., NRC license, etc.) so the road is closed while the trucks are actually on the highway.

This includes, as a minimum, the barricading of the road with attendant flagmen to eliminate any public vehicles from being on the road during the actual shipment. Site guard force is included to ensure that no attempts are made to affect the shipment or shipment contents. With the resources required and the fact that these shipments are normally made early in the morning, equipment such as light trees are required. Additionally, the risk of performing these shipments on a public highway is higher than performing them completely out-of-commerce on an internal site haul road.

U.S. Highway 20 road closures are usually for 35–60 minutes depending on the speed allowed for the shipment being made. With the high number of actual shipments planned, this still results in the road being closed for approximately 12,000 hours for the next 30–40 years. Even though the actual closure of the road is not an excessive amount of time, the preparation and completion time generally runs into a four hour period of time with approximately 10–12 personnel supporting the closure, not counting the actual transport crew.

The process of closing the public highway consists of:

- Notification of the State of Idaho Department of Transportation
- Setting up three sets of road signs and light trees (for nighttime shipments): one on U.S. Highway 20 east of MFC junction, one on U.S. Highway 20/26 west of the puzzle intersection, and one on U.S. Highway 26, south of the puzzle intersection
- Stop the traffic
- Security sweep of the highway to ensure all non-INL vehicles are clear of the closed road
- Running the transport convoy
- Reopen the highway when the transport convoy passes Gate 1 (for west-bound transports) or Gate 2 (for eastbound transports)
- Removal of the road signs and light trees

3. AFFECTED ENVIRONMENT

The INL Site is an 890-square-mile DOE facility located on the Eastern Snake River Plain. It is primarily located within Butte County, but portions of the INL Site are also in Bingham, Jefferson, Bonneville, and Clark Counties. All land within the INL Site is controlled by DOE, and public access is restricted to highways, DOE-sponsored tours, special-use permits, and the Experimental Breeder Reactor I National Historic Landmark.

Public Highways U.S. 20 and 26 and Idaho 22, 28, and 33 pass through the INL Site, but off-highway travel within the INL Site and access to INL Site facilities are controlled. Currently, approximately 7,237 people work at the INL Site, including 988 people at MFC, 641 at the ATR Complex, and 1,170 people at INTEC. No permanent residents reside on the INL Site. Population centers in the region include large cities (more than 10,000 residents), such as Idaho Falls, Pocatello, and Blackfoot, located to the east and south, and several smaller cities (less than 10,000), such as Arco, Fort Hall, Howe, and Atomic City, located around the INL Site.

The area surrounding the INL Site is classified as a Prevention of Significant Deterioration Class II area and designated under the Clean Air Act (42 USC § 7401 et seq) as an area with reasonable or moderately good air quality while still allowing moderate industrial growth. Craters of the Moon Wilderness Area, which is approximately 6.4 miles southwest of the INL Site boundary, is classified as a Prevention of Significant Deterioration Class I area, and is the nearest area to the INL Site where additional degradation of local air quality is severely restricted. The INL routinely monitors air quality using a network of air monitors. The monitors collect samples to measure particulate matter, radioactivity, and other air pollutants.

3.1 Cultural Resources

Cultural resources are numerous on the INL Site (DOE-ID 2009) and include:

- Prehistoric archaeological sites representing aboriginal hunter-gatherer use over a span of at least 13,500 years
- Late 19th and early 20th Century historic archaeological sites representing settlement and agricultural development, ranching, and other activities
- Historic architectural properties that tell the history of the INL Site from its beginnings as a Navy gunnery range to its many important achievements in nuclear science and technology
- Areas of cultural importance to the Shoshone-Bannock Tribes and other local or regional stakeholders (e.g., historical societies, historic trail organizations).

Many of the cultural resources identified at the INL Site are eligible for nomination to the National Register of Historic Places, and Experimental Breeder Reactor I is recognized as a National Historic Landmark. Archaeological sites and Native American resources are generally located in undeveloped areas, while historic architectural properties, such as Experimental Breeder Reactor I, are usually found within facility perimeters at the INL Site. A tailored approach to management of these resources and compliance with applicable federal and state law are included in the INL Cultural Resource Management Plan (DOE-ID 2009), which is the basis of the Programmatic Agreement among the U.S. Department of Energy Idaho Operations Office (DOE-ID), the Idaho State Historic Preservation Office, and the Advisory Council on Historic Preservation, as well as an Agreement in Principle between DOE-ID and the Shoshone-Bannock Tribes.

Several cultural resource investigations have been conducted along the alternative routes under consideration for the new multipurpose haul road to assess potential impacts associated with proposed INL projects (Reed et al. 1987; Ringe 1988; Pace et al. 2005; Pace 2008). Along the alternative routes, prehistoric archaeological resources, including short-term hunting camps, lithic scatters, and isolated artifact locations, dominate the inventories of identified resources. Archaeological resources dating to historic times (50–150 years before present [BP]) are also present in the area, and the known historic archaeological inventory includes trash scatters, field scars, rock features, and isolated artifact locations. Along T-25, 37 archaeological resources have been identified within 164 ft of the power lines. Along T-24, 26 archaeological resources previously have been recorded in and around the road. Native American human burials are also known within the Critical Infrastructure Test Range Complex (Miller 1994, 1997), though no human burials have been identified in the road corridors. Shoshone-Bannock tribal representatives have further indicated that a variety of natural and cultural resources that are of traditional, cultural, and sacred importance also occur in the areas through which the alternative routes pass.

3.2 Ecological Resources

Vilord et al. (2005) reported on ecological surveys and descriptions of ecological resources associated with T-24 and T-25. Much of the information from that report is relevant to this analysis. Hafla et al. (2010) includes a complete discussion of the ecological resources in the project area. Although Vilord et al. (2005) do not specifically address the proposed new route south of the existing T-25 and power line (Preferred Alternative), a similar route called "East Powerline Road with Shortcut" is described. New surveys were conducted on the proposed alternative routes only for pygmy rabbits and sensitive plant species. Surveys for sage-grouse leks along both alternative routes are on-going. The Preferred Alternative proposed route has not been surveyed for any other ecological resources.

3.2.1 Vegetation Communities

Vilord et al. (2005) surveyed and described plant communities along T-24 and T-25. On the two routes surveyed, eight vegetation classes were identified and described. Vegetation classes were based primarily on dominant and codominant species within each plot. Those eight plant communities include sagebrush steppe, sagebrush/rabbitbrush, sagebrush/saltbush, rabbitbrush, rabbitbrush/saltbush, native grasslands, crested wheatgrass, and annual/playas.

Vilord et al. (2005) also reported that species richness was, on average, five species per plot greater on T-24 than on T-25. They also reported higher species richness in plots along T-24 was largely due to greater native perennial forb diversity, indicating that the ecological condition of plant communities along T-24 is better than that along T-25.

3.2.2 Soils

Vilord et al. (2005) reported that three general soil groups are located along the proposed routes: sands, sands over basalt, and loess (Olson et al. 1995). The T-24 route is classified as 31% loess, 64% as sands over basalt, and 4% as sands. All of T-25 is classified as loess.

The loess soils are primarily loams and silt loams, and are deep to very deep to bedrock. Revegetation on these soils is limited by available water-holding capacity, and there is a slight hazard of wind erosion (Olson et al. 1995).

The sand and sand over basalt soils have a high hazard of wind erosion (Olson et al. 1995), which imparts certain limitations to use of these soils. These soils are classified as Capability Class VIIe (very severe limitations that make them unsuitable for cultivation or range improvement) due to erosion and limited water-holding capacity, which indicates poor suitability for revegetation (Olson et al. 1995). These soils are also quite susceptible to invasion by non-native annual plants, primarily cheatgrass and annual mustards.

3.2.3 Invasive and Non-Native Species

A total of 11 Idaho noxious weeds have been identified on the INL Site. Of those, only musk thistle and Canada thistle were reported by Vilord et al. (2005) to occur in the proposed road corridors. Other non-native or invasive plants or both found on or near the proposed road corridors include cheatgrass, Russian thistle, halogeton, tumble mustard, and crested wheatgrass.

Cheatgrass was present on 98% of both the T-25 segments and T-24 segments (Vilord et al. 2005). Halogeton was present on 98% of the T-25 segments, but on only 64% of the T-24 segments (Vilord et al. 2005). These non-native annual species are very quick to colonize any new disturbance and are very difficult to eradicate once they are present.

3.2.4 Sensitive Plant Species

A list of the sensitive plant species that have the potential to occur within the area affected by an upgrade of either T-24 or T-25 was compiled using data from the Idaho Conservation Data Center (Idaho CDC 2008). All sensitive species known to occur in Butte, Custer, Jefferson, Bonneville and Bingham counties were considered.

A survey for species with habitat requirements similar to the conditions occurring around the affected area was completed in June of 2009 along both T-24 and T-25. Walking surveys were conducted along a 200-ft-wide corridor. The annual precipitation level provided conditions conducive to detecting these species. Although suitable habitat for the sensitive plant species was located, none of the specific plants in question was found (Hafla, et al. 2010).

3.2.5 Ethnobotany

Vegetation plot data collected along T-25 and T-24 were also analyzed by Vilord et al. (2005) for the frequency of occurrence of several species of ethnobotanical concern. A list of species thought to be of historical importance to local tribes was compiled from Plant Communities, Ethnoecology, and Flora of the Idaho National Engineering Laboratory (Anderson et al. 1996). The list included those species documented to have been used by "indigenous groups of the eastern Snake River Plain," (Anderson et al. 1996).

Vilord et al. (2005) reported that the frequency of species occurrence in plots along either T-24 or T-25 was similar for many of the most common species such as Indian ricegrass, big sagebrush, green rabbitbrush, and flatspine stickseed. One commonly occurring species, basin wildrye, occurred much more frequently in plots along T-25 than along T-24. They also reported that substantial differences in frequency of occurrence between roads were apparent for less common species such as textile onion, fernleaf biscuitroot, and narrowleaf goosefoot (see Table 2).

Because those surveys were conducted late in the growing season the detectability of several of the species of ethnobotanical concern was low. For example, both of the onion species are highly desirable forage for small mammals and were likely heavily grazed in June and July, making them difficult to survey in October. From vegetation sampling conducted in June and July in similar plant communities elsewhere on the INL (Blew et al. 2004), it is known that desert biscuitroot occurs much more frequently than was detected on this survey, indicating it may die back early in the season and doesn't leave a distinct skeleton, making it difficult to observe. Other species of ethnobotanical concern which are difficult to detect late in the growing season include Bruneau mariposa lily and Anderson's larkspur.

Table 2. Frequency of occurrence (as a percentage) of species of ethnobotanical interest in vegetation survey plot along T-24 and T-25 (Vilord et al. 2005).

Current Scientific Name	T-24	T-25
Achnatherum hymenoides	78.57	82.22
Allium acuminatum	2.38	0.00
Allium textile	14.29	0.00
Artemisia tridentata	78.57	84.44
Artemisia tripartita	0.00	6.67
Calochortus bruneaunis	0.00	2.22
Chenopodium leptophyllum	16.67	33.33
Chrysothamnus viscidiflorus	97.62	97.78
Cirsium arvense	0.00	2.22
Delphinium andersonii	4.76	8.89
Descurainia pinnata	69.05	82.22
Descurainia sophia	47.62	37.78
Ericameria nauseosus	16.67	11.11
Lappula occidentalis	59.52	57.78
Leymus cinerus	23.81	62.22
Lomatium dissectum	19.05	6.67
Lomatium foeniculaceum	0.00	2.22
Opuntia polyacantha	57.14	64.44
Poa secunda	71.43	82.22
Salsola kali	4.76	11.11

3.2.6 Hydrography

Vilord et al. (2005) reported that several ephemeral streams intersect the proposed routes. None of these has any riparian habitat associated with them. Most of them likely carry water in only the wettest of years and probably only associated with spring run-off, a rain-on-snow event, or a rainstorm. None of these streams is gauged, and no information about discharge rates is known to be available. Vilord et al. (2005) also reported that the proposed routes cross several basins that likely hold substantial run-off associated with the type of events described for ephemeral streams. These basins may contain sagebrush steppe, Great Basin wildrye, or biannual species, depending on the frequency and duration of flooding. Vilord et al. (2005) reported that large basins are intersected by all proposed routes.

3.2.7 Wildlife

Scientists have been collecting wildlife data for more than 40 years and have recorded a total of 219 vertebrate species (Reynolds et al. 1986) occurring on the INL Site, many of which are directly associated with sagebrush steppe habitat and are likely resident in the areas considered for the proposed road. These include species that require sagebrush as food or cover for all or a substantial portion of their seasonal habitat requirements. Wildlife species of concern addressed in this analysis include all sage-grouse, pygmy rabbits, migratory birds, Great Basin rattlesnakes, and all large mammal species.

3.2.7.1 Sage-Grouse. The U.S. Fish and Wildlife Service recently released a finding indicating sage-grouse warrant protection under the Endangered Species Act, but are precluded due to other listing priorities (DOI-FWS 2010). Breeding and wintering habitats for sage-grouse occur within the proposed alternative areas (see Figure 2). Although both are important to the survival of sage-grouse, breeding habitats have become a focal point for managing this species. Lyon (2000) estimated the average nest distances to the nearest lek varies from 0.7 to 3.9 miles but may be as great as 12.5 miles. Sage-grouse guidelines (Connelly et al. 2000) suggest that all sagebrush habitats within 2 miles of occupied leks be protected.

The Environmental Surveillance, Education and Research (ESER) Program is conducting a sage-grouse radio telemetry study on the INL Site. The results of this research will be incorporated into the INL Conservation Management Plan[c] and a Candidate Conservation Agreement with the U.S. Fish and Wildlife Service[d]. Sage-grouse were captured and fitted with radio transmitters at numerous leks throughout the INL Site in 2008 and 2009, including at a lek located between T-24 and T-25 southwest of MFC. This lek is located 2 miles or less from both T-24 and T-25. Twelve birds were collared from this lek in 2008, and telemetry surveys show that seven birds remained in the area between T-24 and T-25 through spring and into early summer. Additional surveys are presently underway to identify and assess attendance at all leks in the vicinity of T-24 and T-25.

3.2.7.2 Pygmy Rabbits. Pygmy rabbits are sagebrush steppe obligate species and under consideration for protection under the Endangered Species Act. Pygmy rabbits depend on sagebrush for cover and forage. Once sagebrush is removed from an area, pygmy rabbits disappear (Green and Flinders 1980; Katzner et al. 1997). Populations of pygmy rabbits on the INL Site may be relatively stable because much of the site remains undisturbed. Although ESER has conducted surveys for pygmy rabbit burrows INL Site-wide, little is currently known about the status of pygmy rabbit populations on the INL Site. Suitable sagebrush habitats were identified in the project area.

Surveys were conducted for pygmy rabbits associated with T-24 and T-25 in winter 2010 when there was adequate snow cover to identify tracks. Pygmy rabbit burrows were identified in many locations along T-24 and T-25 (see Figure 2). Most burrows were located in dense patches of basin big sagebrush. All locations were in contiguous, undisturbed sagebrush habitats.

---

c. DOE-ID, *INL Conservation Management Plan,* Draft
d. USFWS, *Candidate Conservation Agreement with the U.S. Fish and Wildlife Service*, Draft

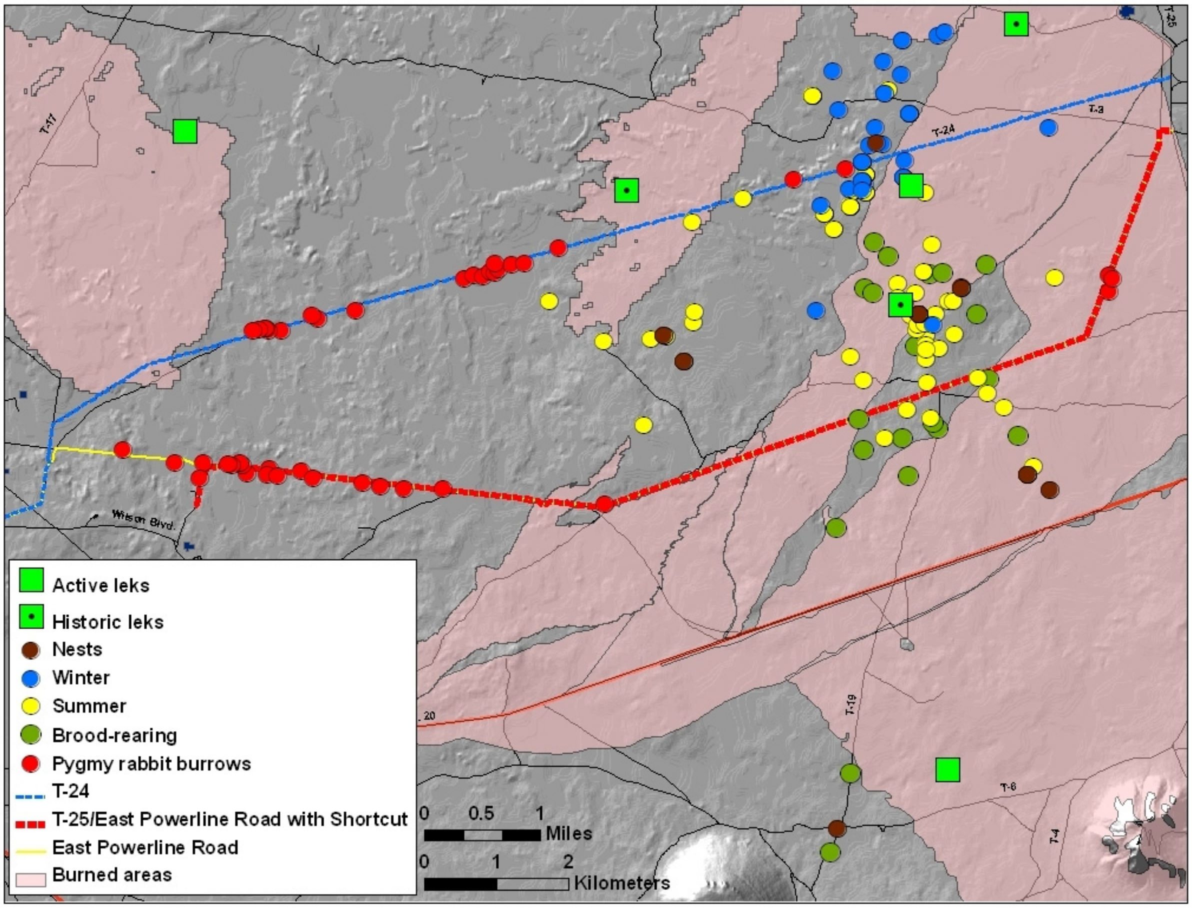

Figure 2. Locations of sage-grouse leks, historic leks, and seasonal use of habitat, as well as pygmy rabbit burrow systems from recent surveys.

3.2.7.3 Birds. Most avian species occupying the INL Site use both sagebrush and grassland habitats from a few days for feeding and resting during migration to several months for breeding and raising young. Many bird species utilize specific habitats for foraging and reproduction.

Although most raptors use the site indiscriminately for foraging, nesting structures, and perching structures are a limiting factor in population abundance and species diversity. Raptors rely on perching structures for nesting, hunting, and resting. Although Vilord et al. (2005) observed no raptor nests on power poles that run adjacent to T-25, several species were observed using the poles for resting and hunting. Raptors observed by Vilord et al. (2005) include Swainson's hawk, red-tailed hawk, ferruginous hawk, northern harrier, prairie falcon, and American kestrel. The only raptor observed by Vilord et al. (2005) on T-24 was a northern harrier. This is probably due to the limited amount of perching structures available to raptors along T-24 (Vilord et al. 2005).

T-24 and T-25 were surveyed for all bird nests during fall 2005 (Vilord et al. 2005). Ninety-eight percent of all nests located were in sagebrush. No ground nesting bird nests were located. Twenty-nine bird nests were located on T-25. Nests were identified as sage sparrow or Brewer's sparrow, sage thrasher, and loggerhead shrike (Vilord et al. 2005).

Fifty-four bird nests were observed on T-24. Bird species observed on T-24 included western meadowlark, white-crowned sparrow, rock wren, and mourning dove. Nests were identified as sage sparrow or Brewer's sparrow, sage thrasher, and loggerhead shrike.

3.2.7.4 Rattlesnakes. Great Basin rattlesnakes are listed as protected non-game wildlife by the State of Idaho (Idaho CDC 2008). On the INL Site, these habitats are typically associated with volcanic features, such as craters, cones, and lava tubes. Vilord et al. (2005) conducted surveys in late October, when the majority of rattlesnakes are already underground in winter hibernacula (C. Peterson unpublished data). Thus, estimates of rattlesnake occurrence by Vilord et al. (2005) were based on the presence of other snake species that occur sympatrically, but remain active later in the season, and on the presence of suitable habitat. The presence of garter snakes or gopher snakes suggests that rattlesnakes may also occur because snakes often over-winter in the same locations on the INL Site (Cooper-Doering 2005).

No winter snake hibernacula were observed by Vilord et al. (2005) on T-25. In addition, little potential rattlesnake winter habitat was observed on T-25 relative to T-24. One garter snake was observed by Vilord et al. (2005) along T-25, which suggests at least one potential rattlesnake hibernaculum is in the area (in October snakes would not be far from a hibernaculum). Fifty-eight percent of the vegetation along T-25 was characteristic of preferred rattlesnake summer habitat (Vilord et al. 2005).

Five garter snake or gopher snake hibernacula or both (i.e., potential rattlesnake hibernacula) were observed by Vilord et al. (2005) on T-24. Fifty-seven percent of the vegetation along T-24 was characteristic of preferred rattlesnake habitat (Vilord et al. 2005). They also found many prey items (i.e., small mammals) along T-24 relative to T-25.

3.2.7.5 Large Mammals. Elk, mule deer, and pronghorn have been observed during semiannual surveys using the general areas of both alternative routes throughout the year. Comer (2000) found that elk tend to utilize sagebrush on lava habitat more frequently than any other habitat type on the INL Site. Pronghorn and mule deer are more randomly scattered throughout the INL Site, with concentrations being greater near the Big Lost River Sinks and juniper woodlands, respectively.

On T-24 and T-25, signs of elk, mule deer, and pronghorn were observed by Vilord et al. (2005) during a survey conducted in fall 2005. Annual large mammal survey data show that herds of mule deer and pronghorn have been documented within 1 mile of the proposed routes during the summer and winter. Elk appear to use this area only during the winter. Additional telemetry studies are presently underway for elk seasonal use of the area surrounding the T-24 and T-25 routes.

3.3 National Environmental Research Park

The INL is the site of the Idaho National Environmental Research Park (NERP). The NERP Program was established by Congress in the early 1970s. The Idaho NERP was chartered in 1975. The primary objectives for research on the NERPs are to develop methods for assessing the environmental impact of energy development activities and to develop methods for predicting and mitigating those impacts. The NERP achieves these objectives by facilitating use of this outdoor laboratory by university and government researchers. Several research and monitoring projects have study sites in the vicinity of the proposed road alternatives.

4. ENVIRONMENTAL CONSEQUENCES

The following sections evaluate the potential environmental consequences that are likely to occur from Alternatives 1 (Preferred Alternative) and 2. Section 4.3 addresses the environmental consequences from the No Action Alternative.

4.1 Cultural Resources

Previous cultural resource investigations along the T-25 power line road and T-24 route provide the basis for an initial evaluation of the nature and extent of cultural resources that may be directly and indirectly impacted by future construction of the haul road. Until construction plans are finalized and specific areas of potential effects are identified, this information is subject to change. If proposed activities extend outside the boundaries of existing surveys, new surveys would be conducted. Any new resources identified in these expanded surveys likely would be similar to those already found to exist along the roads. In addition, once the final area of potential effects is defined, all newly recorded and previously recorded resources located within it would be assessed for eligibility to the National Register of Historic Places and for project effects in consultation with the Idaho State Historic Preservation Office and Shoshone-Bannock Tribes.

Ground disturbance associated with construction of a new haul road under the T-25 (Preferred Alternative) and T-24 alternatives that are being analyzed would be intensive and has the potential to impact archaeological sites and Native American resources located in the selected route. Heavy equipment would move routinely along the chosen route, grading the ground surface, straightening curves, filling low areas, creating appropriate drainage, and bringing in fill to compact and build the road bed. The integrity of any archaeological sites located within the construction zone could be impacted. Resources important to the Tribes, such as animals and plants, may also be impacted.

In addition to direct impacts from heavy equipment and earth-moving, archaeological sites and Native American resources identified along the selected route could also be subject to indirect impacts during construction as a result of higher visibility on the landscape and overall increases in activity levels in an area that has previously been quite remote. Artifacts may be subject to unauthorized collection by road construction crews or impacted 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. After the road is completed, heavy trucks will move routinely through the area and tribally important animals may be struck when trying to cross the new road, or their behavior patterns may be altered.

Operational controls would be implemented prior to and during haul road construction and operation to minimize the potential for adverse direct and indirect impacts to cultural resources in the area of potential effects. A tiered approach with initial efforts focusing on identification and assessment, followed by various protection strategies, as necessary, would be adopted. Table 3 below summarizes the controls that would be implemented for both Alternative 1 and Alternative 2.

Table 3. Proposed construction and operational activities and Cultural Resource controls for the action alternatives.

Proposed Construction Activities	Proposed Construction Controls
Road Development • Blade and level base of road, remove vegetation • Remove basalt, as needed • Add fill gravel to low areas • Install culverts, as needed • Establish turn outs and passing zones • Establish temporary equipment laydown areas General activities • Obtain pit run gravel from Monroe Blvd. gravel pit • Obtain explosives, as necessary, for removal of basalt • Establish fire protection buffers around construction areas	• Complete archaeological and Shoshone-Bannock tribal surveys of proposed road corridor, turn outs, passing zones, fire protection zones, laydown areas, and gravel pit expansions • Modify road orientation slightly to avoid direct ground disturbance within the boundaries of identified cultural resources • Utilize construction techniques that will minimize ground disturbance (e.g. adding fill instead of blading the ground surface) • Complete archaeological investigations, possibly including mapping and test excavation, and/or tribal studies before ground disturbance to catalog and preserve important information and materials before impacts occur • Complete cultural resource monitoring of ground disturbance in sensitive areas with authority to temporarily redirect work to salvage any sensitive materials uncovered • Implement a stop work procedure to guide the assessment and protection of any unanticipated discoveries of cultural materials • Complete cultural resource sensitivity training for construction personnel to discourage unauthorized artifact collection, off-road vehicle use, and other activities that may impact cultural resources, and encourage a sense of stewardship for cultural resources, including tribally sensitive plants and animals • Revegetate disturbed areas not integral to the new road (e.g., construction laydown areas, turnarounds) with native species, including some species of cultural importance to the Shoshone-Bannock Tribes, and implement a program to prevent invasion of noxious weeds • Minimize disturbance to wildlife species important to the Shoshone-Bannock Tribes by utilizing appropriate methods, which could include seasonal or time-of-day restrictions, good housekeeping, and awareness training

Table 3. (continued).

Proposed Operational Activities	Proposed Operational Controls
General activities • Utilize new road for transportation of materials and waste • Install gates and signs • Establish fire protection buffer along new road (≤30 ft each side) • Remove snow from new road, as needed	• Restrict road for official use only • Control invasive and noxious weeds at all disturbed areas to protect plants important to the Shoshone-Bannock Tribes • Minimize disturbance to wildlife species important to the Shoshone-Bannock Tribes by utilizing appropriate methods, which could include seasonal or time-of-day restrictions, reduced speed limits, fencing, warning signs, good housekeeping, and awareness training

4.1.1 Alternative 1—New Route South of T-25 Utilizing the Existing Road to the Extent Possible (Preferred Alternative)

Archaeological surveys, test excavations, historic archive searches, and tribal communications have been conducted for several INL projects located along the T-25 alternative (Reed et al. 1987; Ringe 1988; Pace et al. 2005; Pace 2008). All previous efforts have been focused on or within 164 ft of the power lines. A list of the 37 previously recorded resources within 164 ft of the T-25 alternative is provided in Appendix A, Table A-1. When construction plans are finalized and a specific area of potential effects is identified, many of these resources would be required to be assessed for eligibility to the National Register of Historic Places, as well as anticipated direct impacts during construction. Higher levels of previous investigations along this alternative may result in lower project-related impacts to cultural resources overall.

If project activities extend outside the boundaries of previous surveys, expanded cultural resource surveys may be necessary, and additional resources may be identified. Ongoing communication with the Shoshone-Bannock Tribes may also result in the identification of additional resources. Conversely, it is likely that some of the resources (listed in Appendix A) would fall outside the final area of potential effects and would not be directly impacted by the haul road project. It is likely that all the resources would be located in an area of potential indirect impact, as discussed previously.

4.1.2 Alternative 2—T-24 Road Upgrade

Cultural resource investigations along T-24 have not been as comprehensive as along T-25, and the road remains a primitive two-track trail with no modern developments. Two primary archaeological surveys in 1985 and 2005 (Reed et al. 1987; Pace et al. 2005) have been completed. In 1985, survey efforts were focused in a 328-ft-wide corridor on the north side of the road, and in 2005 a narrow, 65-ft-wide zone on the south side of the road was examined. Since few cultural resource investigations have been conducted within this alternative and the sites remain largely undisturbed, impacts associated with this alternative may be comparatively higher than those anticipated along T-25. Tribal concerns about natural resources also may be elevated in the undisturbed desert through which T-24 passes.

A list of the 26 archaeological resources identified along T-24 is included in Appendix A, Table A-2. Once again, additional surveys may be necessary and additional resources may be identified when a final area of potential effects is defined for the new haul road. In addition, ongoing coordination and communication with the Shoshone-Bannock Tribes may result in the identification of additional cultural resources that are of importance to them in the area. Depending on the exact location of the construction activities, it is also possible that some of the resources listed in Appendix A would not be directly impacted by the project. Once an area of potential effects is defined, all newly recorded and previously recorded resources located within it would require assessments of National Register eligibility and of project effects. Indirect impacts, as described in Section 4.1 are possible at all of the sites listed in Appendix A.

4.2 Ecological Resources

Similar to the cultural resources analysis, previous ecological surveys provide the basis for this evaluation. This information is documented in Vilord et al. (2005) and more recently in Hafla et al. (2010). A complete analysis of the potential effects to ecological resources for T-24 and T-25 are documented in Hafla et al. (2010). Also, like cultural resources, if the proposed activities extend outside the boundaries of existing survey areas, new surveys would be required. This section addresses both the Preferred Alternative and Alternative 2 by specific resource.

Operational controls would be implemented prior to and during haul road construction and operation to minimize the potential for adverse direct and indirect impacts to ecological resources in the area of potential effects. A tiered approach with initial efforts focusing on identification and assessment, followed by various protection strategies, as necessary, would be adopted as summarized in Section 4.2.7.8.

4.2.1 Vegetation Communities

Road improvement along either route would increase soil disturbance and vegetation community fragmentation. An increase in soil disturbance would likely lead to an associated increase in weedy non-native species, and the potential to displace native species in the communities adjacent to the upgraded road would amplify. The prevalence of needle-and-thread grass as a community dominant or co-dominant in plots along T-24 is indicative of sandy soils along that route. Because sandy soils tend to have less structure and, therefore, are more easily displaced, the invasibility of those soils can be quite high. The risk of invasibility combined with the high frequency (0.93) of cheatgrass in plots along T-24 make the potential risk of cheatgrass invasion much higher on T-24 than on T-25. It should be noted that although the frequency of cheatgrass in plots along T-24 is high, abundance of cheatgrass is quite low. Thus, the potential of cheatgrass invasion is high because a ubiquitous seed source exists, not because the community has already been impacted by the species.

In addition to the impacts of upgrading a road as they relate to invasibility, the initial ecological condition of the plant communities prior to disturbance relates to the potential impacts to the plant community. For example, the plots along T-24 tend to have higher total species richness and higher species richness of native forbs and, thus, are in better ecological condition (see Table 4). Therefore, potential impacts would be greater to the plant communities along T-24 because the initial ecological condition of those communities is better than that of the plant communities along T-25. Likewise, the relative heterogeneity of plots within each vegetation class along T-24 indicates more diverse plant communities than those along T-25. In brief, T-25, the Preferred Alternative, has already experienced some level of disturbance; therefore, the overall impact to the plant communities adjacent to T-25 would be much less than it would be to those adjacent to the relatively undisturbed T-24.

Table 4. Average species richness, number of native perennial forb species, number of introduced annual species, and number of noxious weed species per plot along each proposed route.

	T-24	T-25
Species richness	24.21	19.04
No. of native perennial forbs	6.93	4.47
No. of introduced annuals	2.81	2.36
No. of noxious weeds	0.07	0.02

Potential impacts to the vegetation communities along either route can be controlled to some extent by minimizing the footprint of the soil disturbance. Weed control also would be necessary because even the slightest amount of soil disturbance would lead to non-native species invasions. Revegetation along much of T-24 would be of limited value as an operational control due to the limited capability of soils along that route.

4.2.2 Soils

Soil disturbance from road construction would result in a direct loss of native vegetation and would provide opportunities for invasive and other non-native plants to become established.

As much as 69% of the T-24 route may be in areas with sandy soils that are not suitable for rangeland plantings (revegetation), are susceptible to wind erosion, and are at risk of invasion by cheatgrass and other non-native annual plants following disturbance. Because revegetation as an operational control that minimizes impacts of disturbing the sandy soils on T-24 is unlikely to be successful, soil disturbing activities in areas with these soils would be kept to an absolute minimum. T-25 soil is all classified as loess. The loess soils are primarily loams and silt loams, and are deep to very deep to bedrock. Revegetation in these soils is limited by available water-holding capacity, and there is a slight hazard of wind erosion. Operational controls to minimize the disturbance and supplemental irrigation would be used to ensure successful revegetation.

4.2.3 Invasive and Non-Native Species

Soil disturbance is a primary contributor to the spread of invasive plants. Invasive and non-native plants are present on much of T-24 and T-25 and could be spread by mowing, blading, grubbing, and any other means used to remove the vegetation in order to build a road. If the proposed construction schedule occurs coincident with or immediately following seed ripening for several invasive plants, including cheatgrass, spreading would likely occur. Similarly, disturbed soils would be open and available to receive seeds through much of the seed dispersal period for nearly all of the invasive species reported by Vilord et al. (2005). This would require additional efforts for weed management associated with the construction corridor. Because of the sand soils along much of T-24, revegetation is unlikely to be successful for controlling invasive species. Operational controls to minimize invasive and non-native species would include the development and implementation of a weed management plan.

4.2.4 Ethnobotany

The impacts of upgrading either road would likely be greater on less common species than they would be on abundant species. Frequently occurring species are generally quite abundant; thus, removing several individuals would not greatly affect the larger population. Populations of species with more isolated distributions, however, are much more sensitive to the loss of several individuals. Because narrowleaf goosefoot has a relatively low frequency of occurrence overall, but is more common along

T-25, that species would most likely experience a greater impact from disturbances associated with upgrading that route, but would not likely experience a substantial effect to population status. Conversely, textile onion and fernleaf biscuitroot would experience greater impact from an upgrade to T-24 because individuals from those relatively limited populations are found more frequently along that route. Because textile onion and fernleaf biscuitroot are considerably more difficult to re-establish than narrowleaf goosefoot, species of ethnobotanical concern that occur in low frequencies would experience greater impact along T-24 than along T-25.

Because the soil disturbance and risk of non-native species invasion would impact populations of species of ethnobotanical concern along either route, the most effective operational control to protect those populations would be to minimize the amount of soil disturbed. Potential impacts to populations of plant species of ethnobotanical concern also may be controlled by revegetating areas impacted by soil disturbance. Seeds or seedlings are commercially available for about one-third of the species listed in Table 2; therefore, those species may be directly replanted, provided care is taken to choose appropriate subspecies and cultivars. Using a diverse mix of native species for revegetation would be important if species of concern, for which seed or stock is not available, are to re-establish voluntarily. Finally, weed control would be critical to facilitate re-establishment of native communities, including species of ethnobotanical concern. Because of the sand soils along much of T-24, revegetation is unlikely to be successful for controlling impacts to species of ethnobotanical concern for Alternative 2.

4.2.5 Sensitive Plant Species

A sensitive plant species survey was completed in June 2009 along both T-24 and T-25. Walking surveys were conducted 100 ft from the middle of the road on each side (200 ft total) to accommodate proposed road widening and turnouts. The yearly precipitation levels were good for vegetation across the desert. Although suitable habitat for the sensitive plant species was located, none of the specific plants in question was found. Table 5 lists sensitive plant species for which suitable habitat is present on or around the affected area.

Table 5. Sensitive species potentially occurring in the area affected by an upgrade of either T-24 or T-25 and appropriate State of Idaho, U.S. Forest Service Region 4, and Bureau of Land Management Ranking.

Scientific Name	Common Name	State	USFS Reg. 4	BLM[a]
Astragalus aquilonius	Lemhi milkvetch	GP3	S	Type 2
Astragalus diversifolius	Meadow milkvetch	GP2	S	Type 3
Camissonia pterosperma	Wing-seeded evening-primrose	S		Type 4
Catapyrenium congestum	Earth lichen			S
Eriogonum capistratum Rev. var. *welshii* Rev.	Welsh's buckwheat	GP2	S	Type 3
Ipomopsis polycladon	Spreading gilia	2		Type 3

a. Source: BLM (2003).

4.2.6 Hydrography

Ecological impacts by altered hydrography would likely occur in the basins bisected by the proposed road. Because the vegetation class present in these basins is the result of the frequency and duration of flooding, any alteration in the flooding regime would likely alter those plant communities. It is expected that the road constructed through these basins would be elevated to limit road damage due to flooding in the basin. These elevated roadways would act as dams, preventing water from evenly flooding the basin. Installing adequate culverts under roads in these basins would be an essential operational control to minimize alteration of the natural patterns of flooding disturbance and subsequent alteration of the native vegetation communities.

4.2.7 Wildlife

Both alternatives would have common unavoidable impacts to wildlife, including: (1) loss of ground-dwelling wildlife species and associated habitat, (2) displacement of certain wildlife species due to increased habitat fragmentation, and (3) increased potential for collisions between wildlife and motor vehicles. Although there is little difference in the type of impact, differences vary between alternatives in the severity of the impact to some species. Operational controls would result in a reduction to wildlife impacts and are provided in Section 4.2.7.8.

Methods for minimizing impacts to wildlife would include, but are not limited to, seasonal timing of activities, lower speed limits, fencing, warning signs, reflectors, ultrasonic warning whistles, habitat alteration, hazing animals from the road, and awareness programs.

Vehicles frequently strike wildlife on many roads. Mortality would be greatly reduced by reducing speeds to 15 mph and increasing awareness of the presence of any animal that might frequent the area. If wildlife is observed in the road, the driver should stop the vehicle and wait until the animal leaves or encourage it to move on by driving forward slowly. Also, restricting access to authorized vehicles only would also reduce impacts to wildlife.

4.2.7.1 Birds. Bird-vehicle collisions not only result in the death of individual birds, but also in preventing birds from successfully breeding. Destruction of roosting places, hunting perches, and nest sites would influence local populations more than the actual loss of individual birds to vehicles (Forman et al. 2003). Some species are more vulnerable to habitat loss than others. Sagebrush obligate species such as Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse rely on sagebrush for nesting and brood rearing. Project activities would impact birds by removing sagebrush, thus reducing opportunities for successful breeding. Survey results show fewer species of concern located on T-25 than on T-24 (Vilord et al. 2005).

Disturbances associated with activities on and near the proposed road have the potential to permanently displace sage-grouse and other birds during winter and spring. Winter and spring are critical survival and reproductive periods for all birds. Construction activities, including vegetation removal, that occur from May 1 to September 1 would be controlled to preclude damage to active nests of passerines.

Both the ferruginous and Swainson's hawk have been documented to nest on the power line as well as in the Utah juniper trees scattered along T-25 (ESER unpublished data). The increased noise, activity, and dust from additional traffic along T-25 could impact both of these species by displacing them from current hunting and nesting areas or nest abandonment. Collisions with vehicles are also possible.

4.2.7.2 Sage-grouse. Breeding, brood-rearing, and over-wintering habitats for sage-grouse occur within the proposed road upgrade areas (see Figure 2). Although all habitat components are important to the survival of sage-grouse, lek locations (breeding grounds) are commonly considered a focal point for managing this species (Braun et al. 1977). Measures to protect habitat for nonmigratory populations when sagebrush is distributed uniformly includes minimizing disturbing sagebrush and herbaceous understory within 2 miles of active lek locations, and 3 miles when sagebrush is not distributed uniformly (Connelly et al. 2000). Sage-grouse populations on the INL Site exhibit numerous seasonal movements and can be considered migratory populations because they make long-distance movements (more than 6 miles one way) between or among these habitats (Connelly et al. 1988; Connelly et al. 2000). Important nesting habitat of migratory populations requires protection of 11 miles around leks (Connelly et al. 2000). Research has shown that protecting habitat immediately around leks may not provide protection of important nesting areas (Wakkinen et al. 1992). Operational controls discussed in Section 4.2.7.8 would be implemented to minimize impacts on sage-grouse.

4.2.7.3 Pygmy Rabbits. Removing sagebrush for road construction would impact pygmy rabbits directly by loss of individuals and habitat. Indirect impacts would occur by disturbing soils and promoting the invasion of weeds that may alter fire regimes. In addition, roads fragment suitable habitats and create barriers to rabbit movements. Many portions of T-24 contain native vegetation within the middle of the tire tracks. This vegetation reduces the impacts of fragmentation and supports continuity of habitat. Vegetation within the T-25 tracks is sparse and often limited to non-native vegetation. Roads with little to no vegetation growing between the tracks are barriers to movement and dispersal because pygmy rabbits are unlikely to cross open areas. The effect of fragmentation due to wider spaces across the road has likely already occurred on a large portion of T-25, the Preferred Alternative. For either alternative, the route should be shifted 300 ft away from pygmy rabbit locations to prevent direct impacts.

4.2.7.4 Rattlesnakes. Great Basin rattlesnakes are listed as protected non-game wildlife by the State of Idaho (Idaho CDC 2008). Overall, T-24 provides more winter and summer habitat for Great Basin rattlesnakes than T-25 (see Table 6). More potential hibernacula and higher prey availability were found along T-24. However, vegetation along T-25 suggests that it also may have suitable summer rattlesnake habitat. If T-24 is the selected route, existing hibernacula would be destroyed during road construction due to their close proximity to the road (three are within 15 ft). In addition, if construction occurs when snakes occur in high densities at hibernacula (May to early June and September to early October), there could be snake mortality and worker safety concerns. Construction should be avoided during this period to minimize impact to rattlesnakes and worker safety.

If T-24 is selected, a 300-ft buffer should be placed around each hibernacula (see Figure 3), and the road should be rerouted around these buffers to prevent the destruction of hibernacula, snake mortality, and worker safety issues. If T-24 is selected, disturbance should be minimized along the undisturbed portions of the route. Rattlesnake habitats also would become fragmented, and road mortality of snakes would increase (Jochimsen 2006). To mitigate these effects, a series of crossing tunnels should be placed along the portions of the road that go around the buffered hibernacula. In addition, fences to guide snakes into the tunnels should be installed and maintained. If the Preferred Alternative is selected, minimum disturbance should occur along the road in nonburned areas, and disturbed soils should be replanted with native vegetation to prevent degradation of rattlesnake summer habitats.

Table 6. Predictors of rattlesnake occurrence associated with two road corridors, September to October 2005 (Vilord et al. 2005).

Occurrence Predictors	T-24	T-25
Winter		
Snake hibernacula	5	0
Potential snake hibernacula	High	Low
Individual snakes	11	2
Summer		
Vegetation (i.e., proportion of plots in preferred habitats)	0.57	0.58
Prey (i.e., number of small mammals)	18	6

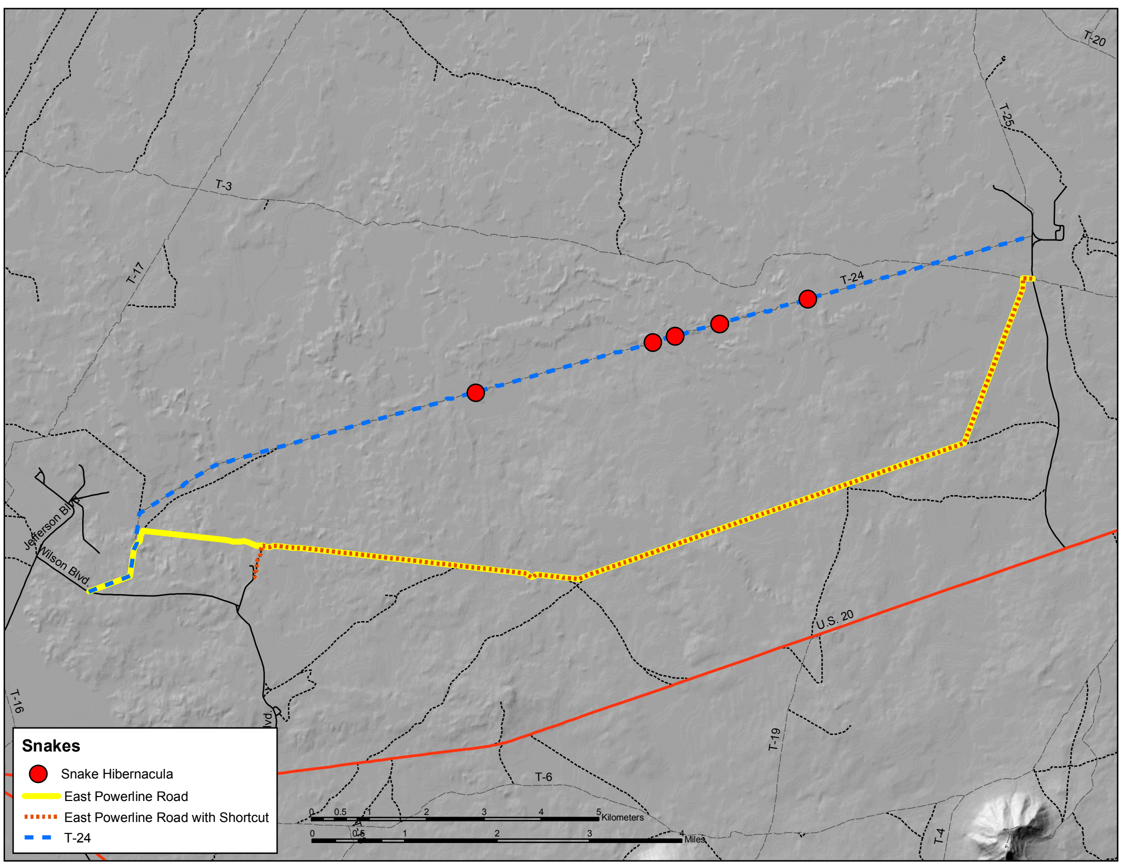

Figure 3. Locations of snake hibernacula found during 2005 survey (Vilord et al. 2005).

4.2.7.5 Large Mammal Species. Vehicle collisions with large mammals cause vehicle damage, human casualties, and lost economic opportunities. Survey data indicate that more large mammals can be found occupying areas closer to T-24 than T-25 (see Table 7).

Table 7. Species occurrences associated with two road corridors, September to October 2005 (Vilord et al. 2005).

Species	T-24	T-25
Brewer's or sage sparrow nests	26	8
Sage thrasher nests	24	19
Loggerhead shrike nests	4	2
Sage-grouse leks	4	1
Raptor observations	2	14
Pygmy rabbit signs	4	2
Garter snakes	10	2
Gopher snakes	1	0
Big Game (locations from annual surveys)		
Elk (groups)	7	4
Mule deer (groups)	2	2
Pronghorn (groups)	8	7

4.2.7.6 Habitat Fragmentation. Habitat fragmentation would result from the proposed road construction and cause some negative impacts no matter which alternative is selected. Because T-24 crosses through a very large area of otherwise undisturbed sagebrush, upgrading this road from a two-track road to a gravel road would cause both direct habitat loss and fragmentation. For the Preferred Alternative, the presence of the power line and road maintenance activities, such as periodic blading, habitat loss, and fragmentation have occurred along this route.

Roads fragment plant and animal populations (Noss 1996). Habitat fragmentation is the process whereby a large, continuous area of habitat is both reduced in area and divided into two or more fragments (Wilcove et al. 1996; Schonewald-Cox and Buechner 1992; Reed et al. 1996; Theobald 1998). Fragmentation can occur when an area is reduced to only a minor degree if the original habitat is divided by roads, canals, fire lanes, or other barriers to free movement of species (Primack 1998).

Infrastructure affects natural systems both directly and indirectly. Roads in the landscape create new habitat edges, alter hydrological dynamics, and disrupt other ecosystem processes and habitats. Road maintenance and traffic contaminate the surrounding environment with a variety of chemical pollutants and noise. In addition, infrastructure and traffic impose dispersal barriers to most nonflying terrestrial animals. The various biotic and abiotic factors operate synergetically across several scales, and cause, not only an overall loss and isolation of wildlife habitat, but also split up the landscape in a literal sense (Seiler 2001).

Changes in the microenvironment at the fragment edge can result from habitat fragmentation. Some of the most important edge effects include microclimate changes in light, temperature, wind, humidity, decreased soil moisture, and incidence of fire (Shelhas and Greenberg 1996; Laurance and Bierregaard 1997; Reed et al. 1996). Each edge effect can have an impact upon the vitality and composition of species in the fragment, and increased wind, lower humidity, and higher temperatures make fires more likely (Primack 1998). Edges produced by roads can also increase nest parasitism by brown-headed cowbirds. Brown-headed cowbirds, the only obligate brood parasite in North America, feed primarily in open areas, but use perches to watch for nest building activities. Edge habitats promote nest parasitism (Brittingham and Temple 1983), and it has been demonstrated on the INL Site that brood parasitism increases on edges and in fragmented habitats (Belthoff and Rideout 2000). Fragmentation affects animal populations in a variety of ways, including decreased species diversity and lower densities of some species in the resulting smaller patches (Reed et al. 1996). Some animal species refuse to cross barriers as wide as a road. For these species, a road or fire line effectively cuts the population in half. A network of roads or fire lines fragments the population even further (Noss 1996). In addition to direct loss of shrub habitats, dispersal capabilities of shrub-obligate species would be affected, and populations may not persist in landscapes of increasingly fragmented patches of sagebrush after disturbance (Braun et al. 1976; Knick and Rotenberry 1995; Knick and Dyer 1997).

Studies of roads and their influence on habitat fragmentation offer sufficient reason for adopting a precautionary stance toward road issues (Brittingham and Temple 1983). Roads precipitate fragmentation by dissecting previously large habitats into smaller ones. As the density of roads in landscapes increases, these effects increase as well. Even though roads occupy a small fraction of the landscape in terms of land area, their influence extends far beyond their immediate boundaries (Reed et al. 1996).

4.2.7.7 Ecological Monitoring and National Environmental Research Park Activities. Ecological research and monitoring activities in the vicinity of the proposed road alternatives potentially could be impacted. These activities include ongoing ecological monitoring and research conducted by the ESER Program and academic researchers. Potential impacts may include direct damage to plots, alteration of natural animal behaviors being investigated, or loss of access to the area to collect data**.**

Most of these potential impacts can be avoided by implementing a few administrative controls. Travel should be strictly limited to that necessary to achieve project goals. Project managers should coordinate their activities with ESER personnel to avoid conflicts with long-term scheduled monitoring activities, such as the breeding bird survey, long-term vegetation survey, big game surveys, sage-grouse lek routes, and other data collection activities. It is essential for the continuation of these research and monitoring programs that ESER personnel have access to these areas on T-24 and T-25.

The breeding bird survey sites around the Power Burst Facility would be disrupted if the T-24 route is selected. Selecting the Preferred Alternative would eliminate that impact.

4.2.7.8 Summary of Operational Controls.

Operational controls for ecological resources would include the following:

- To avoid impacts to sage-grouse lek activity between March 15 and May 15, disruptive activity would be restricted to 10 a.m. through 5 p.m. when working closer than 0.6 miles of leks (BLM 2010).
- To avoid impacts to sage-grouse nesting and brood rearing between March 15 and June 30, surface disturbing and/or disruptive construction activities would be prohibited or restricted when in suitable nesting and brood-rearing habitat (BLM 2010).
- To avoid impacts to sage-grouse use of winter habitat between November 15 and March 14, surface disturbing and/or disruptive construction activities would be prohibited or restricted when in mapped or modeled winter habitat (BLM 2010).
- To comply with the Migratory Bird Treaty Act, no vegetation removal or surface disturbing activities would take place between May 1 and September 1 without first conducting surveys to confirm the absence of nesting birds. These surveys would be conducted no more than two weeks prior to the activity.
- All disturbed areas associated with Alternative 1 (T-25) would be revegetated with native species of local origin.
- A weed management plan would be developed and implemented.

4.2.7.9 Effects on INL Natural Resource Aspects. The following summarizes the evaluation of consequences of the Preferred Alternative (T-25) and Alternative 2 (T-24) on ecological resource aspects. Table 8 compares the potential impacts for each alternative.

- **Reduce the need for rehabilitation following road construction**. The T-24 and T-25 routes would be the same width and are nearly the same length and would have the same impact. However, most of the T-24 route passes through areas with soils that are not suitable for revegetation, and the impacts associated with failure to rehabilitate likely would be permanent. The T-25 route would also require substantial efforts to revegetate.

- **Threatened, endangered, and sensitive species (this includes State of Idaho-designated species) and their habitat.** More sensitive species were recorded on T-24 than on T-25. This was, in part, due to finding new snake hibernacula on T-24. No snake hibernacula are known along T-25.

- **Sage-grouse, pygmy rabbits, and other sagebrush-obligate species and their habitat.** The power line on T-25 has already altered habitat such that it is less suitable for sage-grouse and pygmy rabbits because it provides artificial perches for raptors. The sagebrush habitat on T-24 has no such artificial alteration. More pygmy rabbit sightings were recorded on T-24 than on T-25. Selecting T-24 would result in greater impact to sage-grouse, pygmy rabbits and other sage-grush obligate species.

- **Minimize habitat loss and fragmentation.** Because T-24 crosses through a very large area of otherwise undisturbed sagebrush steppe, upgrading this road from a two-track road to a gravel road would cause both direct habitat loss and fragmentation. Implementing the recommended operational controls would alleviate some of the effects of fragmentation. However, for certain species, this fragmentation cannot be mitigated. For T-25, the presence of the power line and periodic blading have caused habitat loss and fragmentation.

- **Culturally important flora and fauna.** Selecting T-24 would have direct impacts to ethnobotanical species. Selecting T-25 would mitigate this loss because the sagebrush habitat is not as good as that of T-24.

- **Large, undeveloped sagebrush steppe ecosystem.** As described previously, T-24 crosses a very large, mostly undisturbed area of sagebrush steppe. Selecting this route would not maintain a large, undeveloped sagebrush steppe ecosystem. Selecting the T-25 route would not directly affect maintaining a large undeveloped sagebrush steppe ecosystem because the existing power line and road have already caused disturbance in that area.

- **Plant genetic diversity.** Substantial revegetation would be required no matter which route is selected. It is possible to maintain plant genetic diversity by using only locally collected plant materials to revegetate the area. This would include locally collected seeds or transplanted "wildings." Because of the sand soils along much of T-24, revegetation as an operational control for Alternative 2 is unlikely to be successful.

- **Unique ecological research opportunities.** Because the unique ecological research opportunities at the INL Site are due to the large, undeveloped, unfragmented sagebrush steppe ecosystem, any alternative that changes those characteristics would not support these unique ecological research opportunities. Because developing the T-24 route would fragment and otherwise impact this undeveloped area, selecting this alternative would result in a reduction in the potential to maintain the unique opportunities for ecological research presently available on the INL Site. Selecting the T-25 route may support the continuation of these opportunities, but other impacts to natural resources would occur.

- **Minimize invasion of non-native species, including noxious weeds**. All of the proposed routes would cause disturbance to soils and vegetation communities that would open the door to invasive species. The most cost effective way to prevent invasive species following a disturbance such as is proposed, is to successfully revegetate those disturbed areas with desirable vegetation. However, because of the sand soils encountered on the T-24 route that are known to limit successful revegetation, it is unlikely that this operational control would be effective in those areas. The T-25 route would still require substantial efforts to revegetate.

The summary in Table 8 indicates that natural resource aspects are less affected by selecting Alternative 1, the Preferred Alternative. Alternative 2, the T-24 route, would have the greatest impact to ecological resources.

Table 8. Evaluation matrix for natural resource aspects (for alternative comparison only; the scores do not constitute a determination of significance).

	Alternative 1 T-25 [a]	Alternative 2 T-24 [a]
Reduce the need for rehabilitation following construction	1	0
Threatened, endangered, and sensitive species and their habitat	2	1
Sage-grouse and other sagebrush obligate species and their habitat	2	0
Minimize habitat loss and habitat fragmentation	1	0
Culturally important flora and fauna	2	1
Large undeveloped sagebrush steppe ecosystem	1	0
Plant genetic diversity	2	2
Unique ecological research opportunities	1	0
Minimize invasion of non-native species, including noxious weeds	2	0
Total	**14**	**4**

a. 3—Supports natural resource aspect.
2—May support natural resource aspect with implementation of resource-specific mitigation.
1—May support natural resource aspect, but may cause other impacts regardless of mitigation.
0—Does not support natural resource aspect.

4.2.7.10 Mitigation Actions Required. Many of the potential impacts to ecological resources as noted above could be eliminated or reduced by successfully revegetating the disturbed areas. However, the soils found along T-24 are known to be unsuitable to support successful revegetation. Successful revegetation on these soils is limited by insufficient water-holding capacity due to soil texture and/or soil depth, and severe risk of wind erosion. Mitigation would require implementation of demonstrated successful methods for overcoming these limitations.

4.3 Air Quality

Construction and operation of the haul road have the potential to generate substantial quantities of particulate emissions (dust). Sources of emissions from construction include bulldozing, grading, base and sub-base hauling and dumping, and additional grading for the finished road. Operations emissions would result from some 640 possible trips per year over the road by heavy trucks. This analysis is for particulate matter 10 µm and smaller (PM)-10, which is regulated for protection of ambient air quality.

Larger particulate matter would be expected to settle out near where it is suspended and not be an issue for ambient air receptors, i.e., members of the public. Dust control measures would be required for all construction activities and for waste shipments once the road is completed. Control measures typically involve watering during construction and watering or soil fixatives during operations.

Particulate emissions during construction and operation of the haul road were estimated using U.S. EPA AP-42 air pollutant emission factors (EPA 2004). Credit was taken as prescribed in AP-42, and as required, for dust control measures, which allows for 80% reduction in the calculated particulate emissions. Assumptions and calculations are detailed in EDF-9568.

4.3.1 Alternative 1—New Route South of T-25 Utilizing the Existing Road to the Extent Possible (Preferred Alternative)

Of the two alternatives, this route is closer to ambient air receptors, i.e., members of the public traveling U.S. Highway 20 across the INL Site. The distance between the T-25 road and U.S. Highway 20 varies from about 1.4 miles to about 2.5 miles. Total emissions for construction (assumed three months) and for one year of operation of the Preferred Alternative are shown in Table 9.

Table 9. Construction and operation emissions of PM-10 for the T-25 haul road alternative.

Construction Emissions	24-hr Average (lb/hr)	Annual Average (lb/hr)	Total Annual (ton)
Bulldozing and preparation	0.36	0.06	0.28
Hauling base and sub-base	10.02	1.78	7.81
Dumping base and sub-base	0.09	0.02	0.07
Grading base and sub-base	0.08	0.01	0.06
Total Construction Emissions	**10.6**	**1.88**	**8.22**
Operation emissions (1 year)	2.30	0.41	1.80

Dispersion and downwind concentrations of PM-10 were modeled with the AERMOD dispersion model (EPA 2004). Emissions were modeled as a line source, the “line” being the route of the T-25 road alternative. Road/disturbed width was assumed to be 24 ft. For modeling impacts to ambient air, receptors were placed at 547-yd intervals along U.S. Highway 20 to the south of the project area. Receptors were also located at the boundary of Craters of the Moon Wilderness Area, about 18.6 miles west-southwest of Central Facilities Area. Results are shown in Table 10. Calculated increases in PM-10 concentrations in air due to the haul road would be below significant contribution levels set by the Idaho Department of Environmental Quality (IDAPA 58.01.01.006.105).

Table 10. Impacts on air quality from construction and operation for the T-25 haul road alternative.

		U.S. Highway 20		Craters of the Moon	
		Modeled Increase	Significant Contribution Level[a]	Modeled Increase	Significant Contribution Level[a]
Averaging Period	Release Rate (lb/hr)	Air Concentration ($\mu g/m^3$)			
Construction					
24 hours	10.6	3.0	5	0.040	1
Annual	1.9	0.11	1	NA	NA
Operation					
24 hours	2.30	0.6	5	0.009	1
Annual	0.41	0.02	1	NA	NA

a. From IDAPA 58.01.01.006.105. Significant contribution level for Craters of the Moon is shown here for comparison but does not apply to the haul road because the distance is greater than 6.2 miles.

4.3.2 Alternative 2—T-24 Road Upgrade

Total emissions for construction (assumed three months) and for one year of operation of the T-24 alternative are shown in Table 11. The lower overall emissions for T-24 compared to T-25 are due to the shorter length of the T-24 route (11.9 vs. 12.8 miles).

Table 11. Construction and operation emissions of PM-10 for the T-24 haul road alternative.

Construction Emissions	24-hr Average (lb/hr)	Annual Average (lb/hr)	Total Annual (ton)
Bulldozing and preparation	0.38	0.07	0.29
Hauling base and sub-base	8.50	1.51	6.63
Dumping base and sub-base	0.089	0.014	0.06
Grading base and sub-base	0.07	0.013	0.06
Total Construction Emissions	**9.02**	**1.61**	**7.04**
Operations Emissions	2.14	0.38	1.67

Emissions from construction and operation of the T-24 road were modeled as for the T-25 road. Particulate emissions from this alternative would have slightly lower impacts on ambient receptors along U.S. Highway 20 than for the Preferred Alternative. Impacts on air quality at Craters of the Moon would be negligible and comparable to those of the Preferred Alternative (see Table 12).

Table 12. Impacts on air quality from construction and operation for the T-24 haul road alternative.

		U.S. Highway 20		Craters of the Moon	
		Modeled Increase	Significant Contribution Level[a]	Modeled Increase	Significant Contribution Level[a]
Averaging Period	Release Rate (lb/hr)	Air Concentration ($\mu g/m^3$)			
Construction					
24 hours	9.0	2.5	5	0.034	1
Annual	1.6	0.1	1	NA	NA
Operations					
24 hours	2.14	0.6	5	0.008	1
Annual	0.38	0.02	1	NA	NA

a. From IDAPA 58.01.01.006.105. Significant Contribution level for Craters of the Moon is shown here for comparison but does not apply to the haul road because the distance is greater than 6.2 miles.

4.4 Accidents

This section addresses both of the action alternatives (Alternative 1 and Alternative 2) because the impacts from accidents would be the same. Two types of transportation accidents were analyzed: a) transportation accidents during construction and b) accidents during hazardous material transportation operations on the haul road.

4.4.1 Accidents During Construction

During construction of the roadway, approximately 80,600 cubic yards of gravel and asphalt would be hauled (Carnahan 2010) over site and public roads from the Monroe gravel pit near the ATR Complex to MFC, a distance of approximately 24.8 miles (Reference PRD-310). Conservatively assuming that small 14 cubic yard dump trucks are used, approximately 5,800 truck loads would be made. According to the Federal Motor Carrier Safety Administration (FMCSA 2007), large trucks are involved in 33.4 non-fatal crashes per 100 million miles traveled. Therefore, if the national crash trend prevails, the project could expect approximately 0.05 crashes during the entire construction project. The project intends to minimize the use of public roads to the extent possible during construction to further reduce any public impacts.

4.4.2 Accidents During Transport Operations

Accident scenarios involving accidents during hazardous materials transportation operations were also analyzed (PLN-1851). In accordance with the Hazardous Materials Transportation Act (49 USC 5101-5127) and DOE Order 460.1B, off-INL-Site transports of hazardous materials (transportation on public roads) must comply with DOT regulations. For on-INL-Site shipments, where the public is excluded from traveling, it is DOE's policy to also comply with DOT regulations when practicable. However, on-INL-Site shipments that cannot be fully compliant to DOT or NRC transportation regulations must meet the safety basis requirements of 10 CFR 830 and demonstrate a level of safety and protection equivalent to what would be provided by shipments that are fully compliant with

DOT regulations. Due to the unusual and often unique nature of DOE-owned waste or radioactive material, packagings that meet the rigorous DOT or NRC requirements are sometimes not available or nonexistent. In such cases, alternate packagings and transport techniques are employed. One means of providing equivalent safety is to close public access roadways, such as U.S. Highway 20, during the transport, as described under the No Action Alternative. The 10 CFR 830 requirements, as well as additional precautions discussed in the following paragraphs, would apply to both action alternatives.

Equivalent safety is routinely documented in transport plans that analyze reasonable and bounding accident scenarios. Transport plans address other transportation- and safety-related items, such as:

- Speed and weight restrictions
- Security escorts
- Vehicle inspections
- Payload tie downs
- Container restrictions and nuclear criticality controls
- Transport routes and traffic controls
- Radiological and nuclear inventory controls
- Emergency preparedness.

In addition, Hazardous Waste Management Act/Resource Conservation and Recovery Act permits covering waste management activities at INL Site facilities would include written contingency plans and prevention and preparedness plans. Those plans, as well as the INL Site emergency plans, would describe the response measures used to deal with potential emergencies involving hazardous materials, radioactive waste, radioactive materials, and mixed waste.

The transport plans address a variety of transportation accidents and include:

- Dropping a shipping container
- Improper loading of a shipping container
- Single vehicle crash during transport
- Multiple vehicle crash during transport.

Dropping an unlicensed shipping container could result in a cracked, but largely intact, shipping container. This could pose contamination and penetrating radiation hazards. Dropping a licensed cask is not likely to produce any adverse effects to workers or public exposure because the casks are specifically engineered to provide protection from such events.

During transportation, the principal material hazard originates from the radioactive inventory of the payload. As an example, the remote-handled transuranic waste stored at the Radioactive Waste and Scrap Facility represents a radionuclide inventory at the INL Site (DOE 2009). During retrieval or transport, a full breach of the shipping container (or other loss of shielding) could result in workers being exposed to radiation fields as high as 15,000 rem/hr at the surface of the container; however, most of the remote-handled transuranic waste would produce exposures below 1,000 rem/hr at direct contact for a full container breach.

Crashes involving the transport vehicle or other cars could happen from MFC to INTEC or other INL Site areas. A safety analysis accident scenario involving a container of Hot Fuel Examination Facility waste material was analyzed. The scenario included a truck accident with an ensuing diesel fuel fire as a credible bounding event (PLN-1851). The analysis resulted in establishing a public setback distance of 2,149 ft to ensure the dose to the public would not exceed 1.0 rem. The setback distance of 2,149 ft assumes an unlicensed but shielded shipping container and a container payload of 620 Pu-239 equivalent curies; higher payloads would result in higher setback distances. Dropping a shipping container, improper loading, and single or multiple vehicle crashes are considered bounded by the diesel fire scenario.

A variety of control measures are employed to prevent such accidents. For out-of-commerce shipments, U.S. Highway 20 would be closed for the No Action Alternative. In addition, all alternatives would require a security escort, only trained professional drivers are used, and transport vehicle drivers are trained to meet all appropriate DOT driver qualifications. Transport of radioactive or other hazardous material is conducted only when the weather and road conditions are deemed safe for transit. Transport vehicles are carefully inspected prior to each shipment to ensure they are mechanically road-worthy.

It is important to note that all alternatives must either be fully compliant with DOT or NRC transportation regulations or demonstrate equivalent safety; a nonpublic roadway, such as alternative routes analyzed in this document, does not relieve DOE from providing and documenting equivalent safety.

4.5 Intentional Destructive Acts

This section addresses both of the action alternatives, because the impacts from intentional destructive acts would be the same. The plausible impacts from intentional destructive acts are not necessarily bounded by potential accident scenarios identified previously. In the aforementioned accident evaluation, credit was taken for the transport container. In accordance with established DOE accident analysis protocols, the accident scenario assumed that a reasonable fraction of material is leaked to the environment and that another fraction is dispersed to the environment. An intentional destructive act could damage the transport containers more than what would occur during a bounding accident.

However, transport of radioactive waste and radioactive material at the INL Site routinely employs a variety of measures that mitigate the likelihood and consequences of intentional destructive acts. During shipment of such materials, trained and armed security guards escort the transport vehicle. Although their primary function is to keep wayward motorists from approaching the transport vehicle, the guards also are trained and available to keep potentially threatening individuals away. Furthermore, the potential for intentional destructive acts is reduced by the routine employee and visitor screening processes and access controls in place at the INL Site. Additional screening of the transport drivers for behavioral and substance abuse issues, having several personnel involved in all aspects of the operations, and strictly limiting public access to the shipments provide enhanced controls.

4.6 No Action Alternative

4.6.1 Cultural Resources

There would be no impacts to cultural resources under the No Action Alternative.

4.6.2 Ecological Resources

Ecological resources would not be impacted from the No Action Alternative.

4.6.3 Air Quality

No impacts to air quality would result from the No Action Alternative.

4.6.4 Accidents

For the No Action Alternative, two types of accidents are postulated: a) those accidents that could occur when the road is closed for an out-of-commerce shipment, and b) those accidents that could occur when a DOT-compliant shipment is conducted, i.e., when U.S. Highway 20 is not closed.

For out-of-commerce shipments, the postulated accidents and means of addressing them are the same as for the Preferred Alternative and Alternative 2 described in Section 4.2.9.2 above. The transport plan, its accident scenarios, and control measures, etc. are the same for either an upgraded road or continued use of U.S. Highway 20. In either case, 10 CFR 830 requires DOE to demonstrate safety equivalent to DOT regulations.

If the no-action alternative is selected, approximately 1200 of the estimated 10,000 - 18,000 shipments would be conducted as in-commerce shipments where U.S. Highway 20 is not closed (EDF-9513). In these cases, trucks hauling the hazardous material would have an opportunity to crash into public motorists. These compliant shipments are estimated to travel a distance of 24.8 miles between MFC and the ATR Complex. According to the Federal Motor Carrier Safety Administration, large trucks are involved in 33.4 non-fatal crashes per 100 million miles traveled. (FMCSA 2007). Therefore, if the national crash trend prevails, the project could expect 0.02 crashes during operations. This value is probably highly overestimated because the crash rate includes all large trucks whereas only two percent of large trucks involved in non-fatal crashes were carrying hazardous materials.

4.6.5 Intentional Destructive Acts

For the No Action Alternative, the postulated intentional destructive acts and means of addressing them are essentially the same as for Alternatives 1 and 2. The control measures described are the same for either an upgraded road or continued use of U.S. Highway 20. The anticipated 480 in-commerce shipments, where the highway is not closed, present a slightly increased opportunity risk because such shipments do not require security escorts. However, the overall risk is reduced because the shipments generally would have a lower radioactive inventory and would be less attractive to threatening individuals, thus reducing both the consequences and probability of an event.

4.7 Summary of Environmental Consequences of Alternatives—Cumulative Impacts

Cumulative impacts result when the effects of an action are added to or interact with other effects in a particular place and within a particular time. While they may be insignificant individually, cumulative impacts potentially accumulate over time from one or more sources, and can result in the degradation of important resources. Because federal projects cause or are affected by cumulative impacts, assessment of cumulative impacts is required under the National Environmental Policy Act (42 USC § 4321 et seq).

4.7.1 Cultural Resources

Cumulative impacts to cultural resources from construction and use of the haul road cannot be determined until the area of potential effects has been finalized and information gathering (i.e., archaeological surveys, tribal communications, National Register assessments) is completed. However, project activities, as well as opening a relatively remote area of the INL Site to increased human traffic could result in increased loss of cultural resources by looting, vandalism, etc. Cultural resource awareness training for project personnel and other INL employees who may use the haul road, additional cultural resource investigations prior to construction, regular monitoring of known cultural resources, and adherence to any agreements that may develop from this project, such as controlled access, would reduce cumulative impacts to cultural resources.

4.7.2 Ecological Resources

There is extensive literature discussing the potential short-term and long-term impacts of road building. In addition to the direct impacts from the road, a new road would encourage future development, thus creating additional cumulative impacts. The existence of support infrastructure such as roads can exert a major influence on siting of new facility areas, because it can significantly reduce the cost of siting and operating a project (DOE-ID 1997).

Even though potential cumulative impacts to ecological resources cannot be quantified, it is possible to do a qualitative assessment of what those impacts might be. This new road would move the southern boundary to the north for what remains of the large, undisturbed central core area of the INL Site. That boundary is now U.S. Highway 20, with some interruption by the east power line (primarily along T-25). The power line does cause habitat fragmentation for some species, but not for others. Constructing the road would intensify the fragmentation effect for additional species. The boundary on the west is generally marked by Lincoln Boulevard, INTEC, the Central Facilities Area, and the Power Burst Facility. Recent activities associated with the development of the Critical Infrastructure Test Range Complex have strengthened the effectiveness of the boundary in that area. The National Security Test Range located in what was once the center of that large, undisturbed core area has substantially reduced the size of that undisturbed core area and increased habitat fragmentation.

Because the proposed routes are in the Core Infrastructure Area, a new road between the Critical Infrastructure Test Range Complex and MFC may result in additional future development (DOE-ID 1997). However it is more likely that future development would occur in areas where infrastructure is already established for cost considerations. Constructing new facilities along the new road may increase habitat loss and fragmentation. Between the proposed routes, these impacts would be greater along T-24 and less along T-25.

4.7.3 Air Quality

Cumulative impacts to air quality from the haul road project are shown in Tables 13 and 14. The background PM-10 concentrations are ambient measurements reflecting contributions from all current sources of PM-10 emissions that impact the monitoring locations. As shown in Tables 13 and 14, the haul road project would not add appreciably to background concentrations, and cumulative impacts would be well below National Ambient Air Quality Standards.

Table 13. Cumulative impacts to air quality from construction and operation of the T-25 haul road alternative.

Averaging Period	Modeled Increase	Background	Total	Ambient Air Limit
	Air Concentration (µg/m3)			
Construction				
24 hours	3.0	86	89	150
Annual	0.1	33	33	50
Operation				
24 hours	0.6	86	87	150
Annual	0.02	33	33	50

Table 14. Cumulative impacts to air quality from construction and operation of the T-24 haul road alternative.

Averaging Period	Modeled Increase	Background	Total	Ambient Air Limit
	Air Concentration (µg/m3)			
Construction				
24 hours	2.5	86	89	150
Annual	0.1	33	33	50
Operation				
24 hours	0.6	86	87	150
Annual	0.02	33	33	50

5. PERMITS AND 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. 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).

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 haul road project in consultation with the Idaho State Historic Preservation Office and Shoshone-Bannock Tribes.

Soil disturbing activities, including those associated with the use of unimproved roads, 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." The INL would follow the applicable requirements to manage undesirable plants.

In analyzing the potential ecological impacts of the use of alternative routes 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 could apply include: the Fish and Wildlife Coordination Act (16 USC § 661 et seq.), Bald Eagle Protection Act (16 USC § 668), and the Migratory Bird Treaty Act (16 USC § 715–715s).

The proposed haul road is considered a fugitive source of particulate matter by state (IDAPA 58.01.01.006.47) and federal rules as applied through the State Implementation Plan (DEQ 2010b). Under state regulations, fugitive sources are exempt from permitting (IDAPA 58.01.01.220.01); therefore, the haul road has no permitting requirements. However, due to the proximity to the public and ambient air, a record of frequency and method of dust suppression must be maintained during construction and operation of the haul road (IDAPA 58.01.01.650-651; Tier I Permit

T1-2009.0114 [DEQ 2010a]). Guide (GDE) -369, "Fugitive Dust Control," can be used to determine fugitive dust control options. The road is in an area classified as an attainment and non-maintenance area. Based on air dispersion modeling, there would be no substantial impact to ambient air and no impact to air quality at Craters of the Moon, a mandatory Class I Federal Area.

Transportation of hazardous and radioactive materials and substances is governed by DOT, NRC, and DOE regulations. Out-of-commerce shipments would be shipped per DOE Order 460.1B requirements. These out-of-commerce shipments would be described in a transport plan that demonstrates equivalent safety to the applicable DOT and NRC regulations. All out-of-commerce transportation alternatives, either on U.S. Highway 20 or on a newly constructed road, would be required to provide and demonstrate equivalent safety.

6. LIST OF AGENCIES AND PERSONS CONSULTED

No other federal or state agencies were formally consulted during preparation of this EA.

Communication has been initiated with the Shoshone-Bannock Tribes and Idaho State Historic Preservation Office regarding cultural resources along the T-24 and T-25 routes. Communication and consultation, if necessary, would continue to identify and assess cultural resources and, if necessary, to develop a cultural resource protection plan.

If any of the sensitive species identified in this EA are listed for protection under the Endangered Species Act, DOE would enter into formal consultation with the U.S. Fish and Wildlife Service. The potential to impact species that could be protected under the Endangered Species Act and the potential impacts of that listing to the project would be considered in determining actions to upgrade T-24 or T-25.

Communication with the Upper Snake Sage-Grouse Local Working Group was initiated to solicit guidance on the design of operational controls to minimize impact to sage-grouse. Representatives of the following organizations and agencies were in attendance for the briefing and were provided the opportunity to provide input at the meeting.

- Idaho Department of Lands
- Idaho Department of Fish and Game
- Caribou-Targhee National Forest
- Davis Lake Land and Livestock
- NW Natural Resource Group
- Senator Mike Crapo’s Office
- Natural Resources Conservation Services
- Bureau of Land Management
- U.S. Fish and Wildlife Service
- Senator James Risch’s Office
- Idaho Governor’s Office

7. REFERENCES

10 CFR 830, 2002, "Nuclear Safety Management," *Code of Federal Regulations*, Office of the Federal Register.

10 CFR 1021, 2006, "National Environmental Policy Act Implementing Procedures," *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 1500, 2007, "Purpose, Policy, and Mandate," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 1501, 2007, "NEPA and Agency Planning," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 1502, 2007, "Environmental Impact Statement," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 1503, 2007, "Commenting," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 1504, 2007, "Predecision Referrals to the Council of Proposed Federal Actions Determined To Be Environmentally Unsatisfactory," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 1505, 2007, "NEPA and Agency Decisionmaking," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 1506, 2005, "Other Requirements of NEPA," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 1507, 2005, "Agency Compliance," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 1508, 2005, "Terminology and Index," *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 § 469, 2009, "Archaeological and Historic Preservation Act of 1974," *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.*

16 USC § 715-715s, 1918, "Migratory Bird Treaty Act," *United States Code*.

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

42 USC § 4321 et seq., 1970, "National Environmental Policy Act of 1969," *United States Code*.

42 USC § 7401 et seq., 1977, "Clean Air Act," *United States Code*.

49 USC 5101-5127, 1975, "Hazardous Materials Transportation Act," United States Code.

Anderson J. E., K. T. Ruppel, J. M. Glennon, K. E. Holte, and R. C. Rope,1996, Plant Communities, Ethnoecology, and Flora of the Idaho National Engineering Laboratory, ESRF-005, Environmental Science and Research Foundation.

Belthoff, J. R. and C. W. Rideout, 2000, *Effects of Habitat Fragmentation on Shrub-steppe Birds in Southeastern Idaho*, 2000 Interim Report, Boise State University, Boise, Idaho.

Blew, R. D., A. D. Forman, and J. R. Hafla, 2005, Natural and Assisted Recovery of Sagebrush (Artemisia tridentate) in Idaho's Big Desert: Effects of Seeding Treatments and livestock Grazing on Successional Trajectories of Sagebrush Communities: 2004 Annual Report, S.M. Stoller Corp., January 31, 2005.

BLM, 2003, INEEL Sagebrush Steppe Ecosystem Reserve Management Plan, EA-ID-074-02-067, U.S. Department of the Interior, Bureau of Land Management, Idaho Falls, Idaho.

BLM, 2010, *Greater Sage-Grouse Habitat Management Policy on Wyoming Bureau of Land Management (BLM) Administered Public Lands including the Federal Mineral Estate*, Instruction Memorandum No. WY-2010- 012, U.S. Department of the Interior, Bureau of Land Management, Washington, D.C.

Braun, C. E., M. F. Baker, R. L. Eng, J. S. Gashwiler, and M. H. Schroeder, 1976, "Conservation Committee Report on Effects of Alteration of Sagebrush Communities on the Associated Avifauna," *Wilson Bulletin*, Vol. 88, pp. 165-171.

Braun, C. E., T. Britt, and R. O. Wallestad, 1977, "Guidelines for Maintenance of Sage Grouse Habitats," *Wildlife Society Bulletin*, Vol. 5, pp. 99-106.

Brittingham, M. C. and S. A. Temple, 1983, "Have Cowbirds Caused Forest Songbirds To Decline?" *Bioscience,* Vol. 33, pp. 31-35.

Carnahan, S. Y, Idaho Cleanup Project, 2010, electronic mail to G. G. Streier, Idaho Cleanup Project, March 10, 2010, "MFC to INTEC Haul Road Estimates," CCN #310160.

Comer, M. J., 2000, *Elk Population Characteristics and Habitat Use in Southeastern Idaho*, M. S. Thesis: University of Idaho, Moscow, Idaho.

Connelly, J. W., H. W. Browers, and R. J. Gates, 1988, "Seasonal Movements of Sage Grouse in Southeastern Idaho," *Journal of Wildlife Management*, Vol. 52, No. 1, pp. 116-122.

Connelly, J. W., M. A. Schroder, A. R. Sands, and C. E. Braun, 2000, "Guidelines to Manage Sage-Grouse Populations and their Habitats, *Wildlife Society Bulletin*, Vol. 28, No. 4, pp. 967-985.

Cooper-Doering, S., 2005, *Modeling Rattlesnake Hibernacula on the Idaho National Laboratory*, *Idaho*, M.S. Thesis: Idaho State University, Pocatello, Idaho.

DEQ, 2010a, "Idaho National Laboratory Site, Tier I Operating Permit T1-2009.0114," Idaho Department of Environmental Quality.

DEQ, 2010b, *Idaho State Implementation Plan*, http://yosemite.epa.gov/r10/AIRPAGE.NSF/283d45bd5bb068e68825650f0064cdc2/3a8cf19962deac5a88256b2f007f7896?OpenDocument, Idaho Department of Environmental Quality.

DOE, 2002, Idaho High-Level Waste & Facilities Disposition Final Environmental Impact Statement, DOE/EIS-0287, U.S. Department of Energy.

DOE, 2005, *Draft Environmental Impact Statement for the Proposed Consolidation of Nuclear Operations Related to Production of Radioisotope Power*, DOE/EIS-0373D, U.S. Department of Energy.

DOE, 2009, *Final Environmental Assessment for the Remote-handled Waste Disposition Project*, DOE/EA-01386, U.S. Department of Energy.

DOE, 2010a, DOE Office of Nuclear Energy, http://www.ne.doe.gov/, Web page visited April 5, 2010, U.S. Department of Energy.

DOE, 2010b, DOE Office of Laboratory Facilities Management, http://www.ne.doe.gov/facilitiesmanagement/neFacMgmtOverview.html, Web page visited April 5, 2010, U.S. Department of Energy.

DOE, 2010c, DOE Overview of the I-NERI Program, http://www.ne.doe.gov/INERI/neINERI1.html, Web page visited April 5, 2010, U.S. Department of Energy.

DOE M 474.1-1B, 2003, “Manual for Control and Accountability of Nuclear Materials,” U.S. Department of Energy.

DOE Order 451.1B, 2001, “National Environmental Policy Act Compliance Program,” Change 1, U.S. Department of Energy.

DOE Order 460.1B, 2003, “Packaging and Transportation Requirements,” U.S. Department of Energy.

DOE-ID, 1997, *Comprehensive Facility and Land Use Plan*, DOE/ID-10514, U.S. Department of Energy Idaho Operations Office.

DOE-ID, 2009, *Idaho National Laboratory Cultural Resource Management Plan*, DOE/ID-10997, Rev 3, U.S. Department of Energy Idaho Operations Office.

DOI-FWS,. 2010., 23 FR 13909-13958 Department of the Interior. Fish and Wildlife Service. “Endangered and Threatened Wildlife and Plants; 12-Month Findings for Petitions to List the Greater Sage-Grouse (Centrocercus urophasianus) as Threatened or Endangered.,” Federal Register 23, March 2010: 13909-13958, Department of the Interior, Fish and Wildlife Service, Office of the Federal Register.

EDF-9513, 2010, “MFC-INTEC Road Needs Assessment,” Idaho Cleanup Project.

EDF-9568, 2010, “Air Emissions Analysis for the Multipurpose Haul Road on the Idaho National Laboratory,” Idaho Cleanup Project.

EPA, 2004, *User’s Guide for the AMS/EPA Regulatory Model – AERMOD*, EPA-454/B-03-001, U.S. Environmental Protection Agency.

Executive Order 11593, 1971, “Protection and Enhancement of the Cultural Environment.”

Executive Order 13112, 1999, "Invasive Species," *Federal Register*, Vol. 64, No. 25.

FMSCA, 2007, 2007 Large Truck Crash Overview, http://www.fmcsa.dot.gov/facts-research/research-technology/report/2007LargeTruckCrashOverview.pdf, U.S. Department of Transportation, Federal Motor Carrier Safety Administration.

Forman, R. T., D. Sperling, J .A. Bissonette, A. P. Clevenger, C. D. Cutshall, V. H. Dale, L. Fahrig, R. France, C. R. Goldman, K. Heanue, J. A. Jones, F. J. Swanson, T. Turrentine, and T. C. Winter, 2003, *Road Ecology: Science and Solutions*, Chapter 5, "Wildlife Populations," pp. 113-138.

GDE-369, 2005, "Fugitive Dust Control," Idaho Cleanup Project.

Green, J. S. and J. T. Flinders, 1980, "Habitat and Dietary Relationships of the Pygmy Rabbit," *Journal of Range Management*, Vol. 33, No. 2, pp.136-142.

Hafla, J., A. D. Forman, R. D. Blew, and J. Whiting, 2010, *Ecological Resources Associated With T-24 and T-25 and Potential Effects of Constructing a Haul Road*, STOLLER-ESER-127, S. M. Stoller Corporation.

Idaho CDC, 2008, Idaho Conservation Data Center, http://fishandgame.idaho.gov/cms/tech/CDC/, Idaho Department of Fish and Game, Web page updated February 7, 2008, Web page visited April 5, 2010.

IDAPA 58.01.01.006.47, 1994, "Fugitive Emissions," Idaho Administrative Procedures Act.

IDAPA 58.01.01.650, 2007, "Rules for Control of Fugitive Dust," Idaho Administrative Procedures Act.

IDAPA 58.01.01.006.105, 1994, "Significant Contribution," Idaho Administrative Procedures Act.

IDAPA 58.01.01.220.01, 2006, "General Exemption Criteria," Idaho Administrative Procedures Act.IDAPA 58.01.01.650, 1994, "Rules for Control of Fugitive Dust," Idaho Administrative Procedures Act.

INL 2010, Idaho National Laboratory, Research Programs, https://inlportal.inl.gov/portal/server.pt?open=512&objID=260&parentname=CommunityPage&parentid=1&mode=2&in_hi_userid=2&cached=true, Web page visited April 5, 2010.

Jochimsen, D. M., 2006, *Ecological Effects of Roads on Herpeto-fauna: A Literature Review and Empirical Study Examining Seasonal and Landscape Influences on Snake Road Mortality in Eastern Idaho*, M. S. Thesis: Idaho State University, Pocatello, Idaho, pp. 199.

Katzner, T. E., K. L. Parker, and H. H. Harlow, 1997, "Metabolism and Thermal Response in Winter-Acclimatized Pygmy Rabbits (Brachylagus Idahoensis)," *Journal of Mammology*, Vol. 78, No. 4, pp.1053-1062.

Knick, S. T. and D. L. Dyer, 1997, "Distribution of Black-tailed Jackrabbit Habitat Determined by Geographical Information Systems in Southwestern Idaho," *Journal of Wildlife Management*, Vol. 61, pp. 75-86.

Knick, S. T. and J. T. Rotenberry, 1995, "Landscape Characteristics of Fragmented Shrubsteppe Habitats and Breeding Passerine Birds," *Conservation Biology*, Vol. 9, pp. 1059-1071.

Laurance, W. F. and R. O. Bierregaard, Jr., eds., 1997, *Tropical Forest Remnants: Ecology, Management and Conservation of Fragmented Communities*. Chicago: The University of Chicago Press.

Lyon, A. G., 2000, *The Potential Effects of Natural Gas Development on Sage-grouse (Centrocercus urophasainus) near Pinedale Wyomin*g, M. S. Thesis: University of Wyoming, Laramie, Wyoming.

Miller, S. J., 1994, *Report on the Human Skeletal Remains Recovered at the Power Burst Facility (PBF), Idaho National Engineering Laboratory*, EGG-CS-11519, EG&G Idaho, Idaho National Engineering Laboratory.

Miller, S. J., 1997, *The WERF*/SPERT III Human Skeleton, Idaho National Engineering and Environmental Laboratory, INL CRM Investigation 1996-27, INL CRM Archives.

Noss, R. F., 1996, "The Ecological Effects of Roads," *Road-Ripper's Handbook*, ROAD-RIP, Missoula, Montana.

Olson, G. L., D. J. Jeppesen, and R. D. Lee, 1995, *The Status of Soil Mapping for the Idaho National Engineering Laboratory*, INEL-95/0051, Lockheed Idaho Technologies Co., Idaho National Engineering Laboratory.

Pace, B. R., 2008, *Archaeological Assessment of the East Loop Power Line Road (T-25) Upgrade on the Idaho National Laboratory*, INL/EXT-08-15039, Idaho National Laboratory.

Pace, B. R, C. Marler, H. Gilbert, D. Lowrey, and J. Braun, 2005, *Cultural Resource Assessment of the Power Line Road and T-24 at the Idaho National Laboratory*, INL/EXT-05-01033, Idaho National Laboratory.

PLN-1851, 2009, "Transport Plan for the Transfer of Waste Containers Between RWMC and INTEC, and RSWF and INTEC," Rev. 4, Idaho Cleanup Project.

PRD-310, 2010, "INL Site Transportation Safety Document," Rev. 14, Idaho Cleanup Project.

Primack, R. B., 1998, *Essentials of Conservation Biology*, Second Edition, Sunderland, Massachusetts: Sinauer Associates, Inc.

Public Law 59-209, 1906, "Antiquities Act of 1906," as promulgated in 16 USC 431–433.

Public Law 86-523, 1969, "The Reservoir Salvage Act of 1960," as amended, as promulgated in 16 USC 469–469c.

Public Law 89-665, 1966, "National Historic Preservation Act of 1966," as amended, as promulgated in 16 USC 470, et seq.

Public Law 91-190, 1969, "National Environmental Policy Act of 1969," as promulgated in 42 USC 4321.

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, 1979, "Archaeological Resources Protection Act of 1979," as amended, as promulgated in 16 USC 470aa-mm.

Reed, W. G., J. W. Ross, B. L. Ringe, and R. N. Holmer, 1987, "Archaeological Investigations on the Idaho National Engineering Laboratory: 1984-1985, Revised Edition," *Swanson/Crabtree Anthropological Research Laboratory Reports of Investigations No. 87-1*, Idaho State University, Pocatello, Idaho.

Reed, R. A., J. Johnson-Barnard, and W. L. Baker, 1996, "Contribution of Roads to Forest Fragmentation in the Rocky Mountains," *Conservation Biology*, Vol. 10, pp. 1098-1107.

Reynolds, T. D., J. W. Connelly, D. K. Halford, and W. J. Arthur, 1986, "Vertebrate Fauna of the Idaho National Environmental Research Park." *Great Basin Naturalist*, Vol. 46, No. 3, pp. 513-527.

Ringe, B. L., 1988, "Test Excavation of Ten Sites Along the Powerline Between PBF and EBR-II, Idaho National Engineering Laboratory," *Swanson/Crabtree Anthropological Research Laboratory Reports of Investigations No. 88-6,* Idaho State University, Pocatello, Idaho.

Schonewald-Cox, C. M. and M. Buechner, 1992, "Park Protection and Public Roads,' P. L. Fiedler and S. K. Jains, eds., *Conservation Biology: The Theory and Practice of Nature Conservation, Preservation and Management*, pp. 373-396, New York: Chapman Hall.

Seiler, A., 2001, *Ecological Effects of Roads*, Grimsö Wildlife Research Station, Dept. of Conservation Biology, University of Sweden Agricultural Sciences, S-730 91, Riddarhyttan, Sweden.

Shelhas, J. and R. Greenberg, eds., 1996, *Forest Patches in Tropical Landscapes,* Washington, D.C.: Island Press.

Theobald, D. M., 1998, "Tools Available for Measuring Habitat Fragmentation," Presented at the *Colorado Chapter of the Wildlife Society Annual Meeting*, *January 22, 1998, Grand Junction, Colorado*.

Vilord, S. J., C. L. Jenkins, D. K. Halford, J. R. Hafla, A. D. Forman, R. D. Blew, W. Purrington, and M. R. Jackson, 2005, *Survey and Review of Potential Impacts to Ecological Resources on the INL Due to Construction of a Road as Described in the Draft Environmental Statement for the Proposed Consolidation of Nuclear Operations Related to Production of Radioisotope Power Systems DOE/EIS-0373D*, Stoller-ESER-87, pp. 52, S. M. Stoller Corporation.

Wakkinen, W. L., K. P. Reese, and J. W. Connelly, 1992, "Sage-grouse Nest Locations in Relation to Leks," *Journal of Wildlife Management*, Vol. 65, No. 22, pp. 381-383.

Wilcove, D., M. J. Bean, R. Bonnie, and M. McMillan, 1996, *Rebuilding the Ark: Toward a More Effective Endangered Species Act for Private Land*, Environmental Defense Fund, Washington, D.C.

Appendix A

Known Archaeological Resources

Appendix A

Known Archaeological Resources

Table A-1. Alternative 1 (Preferred Alternative) —Known archaeological resources.

Site No.	Description and National Register of Historic Places Eligibility	Location
10-BM-109	Middle Prehistoric III (3,500–1,300 BP) lithic scatter - potentially eligible to NRHP	Both sides of T-25
10-BM-110	Middle Prehistoric II (5,000–3,500 BP) lithic scatter - potentially eligible to NRHP	Both sides of T-25
10-BM-111	Middle Prehistoric III (3,500–1,300 BP) isolate location - not eligible to NRHP	East of T-25
10-BM-112	General Prehistoric (12,000–150 BP) lithic scatter - potentially eligible to NRHP	East of T-25
10-BM-113	Late Prehistoric II (70 –150 BP) isolate location - not eligible to NRHP	West of T-25
10-BM-114	General Prehistoric (12,00–150 BP) isolate location - not eligible to NRHP	West of T-25
10-BM-115	Middle Prehistoric III (3,50–1,300 BP) lithic scatter - potentially eligible to NRHP	East of T-25
10-BM-116	Middle Prehistoric II (5,000–1,300 BP) campsite with evidence of a fire hearth, stone tool manufacturing debris, game processing tools, and broken dart points - potentially eligible to NRHP	North of T-25
10-BM-117	Middle Prehistoric III (3,500–1,300 BP) lithic scatter - potentially eligible to NRHP	North of T-25
10-BM-118	Middle Prehistoric III (3,500–1,300 BP) lithic scatter- potentially eligible to NRHP	Both sides of T-25
10-BM-119	General Prehistoric (12,000–150 BP) isolate location - not eligible to NRHP	South of T-25
10-BM-122	General Prehistoric (12,000–150 BP) isolate location - not eligible to NRHP	South of T-25
1997-16-22	Dispersed scatter of historic debris (ca. 1920) including domestic trash, crockery, china, milled wood, sheet metal, rubber, and misc metal items probably associated with a nearby historic trail and early land surveys of the region - potentially eligible to NRHP	South of T-25
10-BT-1049	General Prehistoric (12,000–150 BP) lithic scatter - potentially eligible to NRHP	Both sides of T-25
10-BT-1050	General Prehistoric (12,000–150 BP) isolate location - not eligible to NRHP	South of T-25
10-BT-1051	Middle Prehistoric II (5,000–3,500 BP) isolate location - not eligible to NRHP	South of T-25

Table A-1. (continued).

Site No.	Description and National Register of Historic Places Eligibility	Location
10-BT-1052	Middle Prehistoric III (3,500–1,300 BP) lithic scatter. Test excavations in 1988 revealed subsurface cultural deposits and a hearth dated to 310 ± 80 BP - potentially eligible to NRHP	Both sides of T-25
10-BT-1053	General Prehistoric (12,00 –150 BP) lithic scatter - potentially eligible to NRHP	South of T-25
10-BT-1054	Middle Prehistoric (7,50 –1,300 BP) isolate location - not eligible to NRHP	North of T-25
10-BT-1055	General Prehistoric (12,000–150 BP) isolate location - not eligible to NRHP	North of T-25
10-BT-1056	Historic/Prehistoric Site—Multi-component Middle Prehistoric (7,500–1,300 BP) and Historic (150–50 BP) site with broken prehistoric dart points dispersed among eight historic piles of basalt on the edge of agricultural field scars probably cleared for use in the early 1900s - potentially eligible to NRHP	North of T-25
10-BT-1057	Middle Prehistoric III (3,500–1,300 BP) isolate location - not eligible to NRHP	North of T-25
10-BT-1058	General Prehistoric (12,000–150 BP) isolate location - not eligible to NRHP	North of T-25
10-BT-1059	Late Prehistoric I (1,300–700 BP) lithic scatter- potentially eligible to NRHP	Both sides of T-25
10-BT-1060	Late Prehistoric I (1,30 –700 BP) isolate location - not eligible to NRHP	North of T-25
10-BT-1061	General Prehistoric (12,000–150 BP) isolate location - not eligible	North of T-25
10-BT-1062	General Prehistoric (12,000–150 BP) lithic scatter - potentially eligible to NRHP	Both sides of T-25
10-BT-1063	Late Prehistoric I (1,300–700 BP) campsite with evidence of a fire hearth- potentially eligible to NRHP	South of T-25
10-BT-1064	General Prehistoric (12,000–150 BP) isolate location - not eligible to NRHP	North of T-25
10-BT-1159	Middle Prehistoric III (3,500–1,300 BP) isolate location - not eligible to NRHP	South of T-25
10-BT-1246	General Prehistoric (12,000–150 BP) isolate location - not eligible to NRHP	South of T-25
10-BT-1247	Middle Prehistoric III (3,500–1,300 BP) campsite with evidence of a fire hearth. Test excavations in 1988 revealed subsurface cultural deposits- potentially eligible to NRHP	South of T-25
10-BT-1248	Middle Prehistoric (7,500–1,300 BP) isolate location - not eligible to NRHP	South of T-25
10-BT-1249	Late Prehistoric I (1,300–700 BP) isolate location - not eligible to NRHP	South of T-25
2006-03-02	General Prehistoric (12,000–150 BP) isolate location - not eligible to NRHP	West of T-25

Table A-1. (continued).

Site No.	Description and National Register of Historic Places Eligibility	Location
2006-03-03	Middle Prehistoric II (5,000–1,300) isolate location - not eligible to NRHP	South of T-25
2009-01-01	General Prehistoric (12,000–150 BP) isolate location - not eligible to NRHP	North of T-25

Table A-2. Alternative 2—Known archaeological resources.

Site No.	Description and National Register of Historic Places Eligibility	Location
10-BM-109	Middle Prehistoric III (3,500–1,300 BP) lithic scatter - potentially eligible to NRHP	Both sides of T-25
10-BM-110	Middle Prehistoric II (5,000–3,500 BP) lithic scatter - potentially eligible to NRHP	Both sides of T-25
10-BM-111	Middle Prehistoric III (3,500–1,300 BP) isolate location - not eligible to NRHP	East of T-25
10-BM-112	General Prehistoric (12,000–150 BP) lithic scatter - potentially eligible to NRHP	East of T-25
10-BM-113	Late Prehistoric II (70 –150 BP) isolate location - not eligible to NRHP	West of T-25
10-BM-114	General Prehistoric (12,00–150 BP) isolate location - not eligible to NRHP	West of T-25
10-BM-115	Middle Prehistoric III (3,50–1,300 BP) lithic scatter - potentially eligible to NRHP	East of T-25
10-BM-116	Middle Prehistoric II (5,000–1,300 BP) campsite with evidence of a fire hearth, stone tool manufacturing debris, game processing tools, and broken dart points - potentially eligible to NRHP	North of T-25
10-BM-117	Middle Prehistoric III (3,500–1,300 BP) lithic scatter - potentially eligible to NRHP	North of T-25
10-BM-118	Middle Prehistoric III (3,500–1,300 BP) lithic scatter- potentially eligible to NRHP	Both sides of T-25
10-BM-119	General Prehistoric (12,000–150 BP) isolate location - not eligible to NRHP	South of T-25
10-BM-122	General Prehistoric (12,000–150 BP) isolate location - not eligible to NRHP	South of T-25
1997-16-22	Dispersed scatter of historic debris (ca. 1920) including domestic trash, crockery, china, milled wood, sheet metal, rubber, and misc metal items probably associated with a nearby historic trail and early land surveys of the region - potentially eligible to NRHP	South of T-25
10-BT-1049	General Prehistoric (12,000–150 BP) lithic scatter - potentially eligible to NRHP	Both sides of T-25
10-BT-1050	General Prehistoric (12,000–150 BP) isolate location - not eligible to NRHP	South of T-25
10-BT-1051	Middle Prehistoric II (5,000–3,500 BP) isolate location - not eligible to NRHP	South of T-25
10-BT-1052	Middle Prehistoric III (3,500–1,300 BP) lithic scatter. Test excavations in 1988 revealed subsurface cultural deposits and a hearth dated to 310 $\pm$ 80 BP - potentially eligible to NRHP	Both sides of T-25
10-BT-1053	General Prehistoric (12,00 –150 BP) lithic scatter - potentially eligible to NRHP	South of T-25
10-BT-1054	Middle Prehistoric (7,50 –1,300 BP) isolate location - not eligible to NRHP	North of T-25

Table A-1. (continued).

Site No.	Description and National Register of Historic Places Eligibility	Location
10-BT-1055	General Prehistoric (12,000–150 BP) isolate location - not eligible to NRHP	North of T-25
10-BT-1056	Historic/Prehistoric Site—Multi-component Middle Prehistoric (7,500–1,300 BP) and Historic (150–50 BP) site with broken prehistoric dart points dispersed among eight historic piles of basalt on the edge of agricultural field scars probably cleared for use in the early 1900s - potentially eligible to NRHP	North of T-25
10-BT-1057	Middle Prehistoric III (3,500–1,300 BP) isolate location - not eligible to NRHP	North of T-25
10-BT-1058	General Prehistoric (12,000–150 BP) isolate location - not eligible to NRHP	North of T-25
10-BT-1059	Late Prehistoric I (1,300–700 BP) lithic scatter- potentially eligible to NRHP	Both sides of T-25
10-BT-1060	Late Prehistoric I (1,30 –700 BP) isolate location - not eligible to NRHP	North of T-25
10-BT-1061	General Prehistoric (12,000–150 BP) isolate location - not eligible	North of T-25
10-BT-1062	General Prehistoric (12,000–150 BP) lithic scatter - potentially eligible to NRHP	Both sides of T-25
10-BT-1063	Late Prehistoric I (1,300–700 BP) campsite with evidence of a fire hearth- potentially eligible to NRHP	South of T-25
10-BT-1064	General Prehistoric (12,000–150 BP) isolate location - not eligible to NRHP	North of T-25
10-BT-1159	Middle Prehistoric III (3,500–1,300 BP) isolate location - not eligible to NRHP	South of T-25
10-BT-1246	General Prehistoric (12,000–150 BP) isolate location - not eligible to NRHP	South of T-25
10-BT-1247	Middle Prehistoric III (3,500–1,300 BP) campsite with evidence of a fire hearth. Test excavations in 1988 revealed subsurface cultural deposits- potentially eligible to NRHP	South of T-25
10-BT-1248	Middle Prehistoric (7,500–1,300 BP) isolate location - not eligible to NRHP	South of T-25
10-BT-1249	Late Prehistoric I (1,300–700 BP) isolate location - not eligible to NRHP	South of T-25
2006-03-02	General Prehistoric (12,000–150 BP) isolate location - not eligible to NRHP	West of T-25
2006-03-03	Middle Prehistoric II (5,000–1,300) isolate location - not eligible to NRHP	South of T-25
2009-01-01	General Prehistoric (12,000–150 BP) isolate location - not eligible to NRHP	North of T-25