

8 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

8.1 Unavoidable Adverse Impacts

Information on the adverse impacts to the affected environment at the Idaho National Engineering and Environmental Laboratory (INEEL) that cannot be avoided for this proposed action is given in Section 4 of this environmental impact statement (EIS). The environmental impacts from the proposed action are small and will be mitigated by methods described in Section 5. Monitoring methods are described in Section 6. Comparison with the potential impacts from the proposed action to those of the no-action alternative is provided in Table 2-1. Detailed analysis of the potential impacts on public health and safety is provided in the safety evaluation report to be prepared by the U.S. Nuclear Regulatory Commission (NRC). Following is a brief summary of the impacts presented in Section 4 with topical areas classified as resources, ecosystems, or human communities.

- Land Use (Section 4.1)—Ecosystem: Construction activities to occur on an 3.2-ha [8-acre] facility site and an adjoining 4.1-ha [10-acre] laydown area. The 7.3 ha [18 acres] are adjacent to Idaho Nuclear Technology and Engineering Center (INTEC) and have been previously disturbed by other construction activities and land uses. Potential operation impacts include restricted access to the 3.2-ha [8-acre] facility site; and the use of the site for spent nuclear fuel (SNF) receiving, packaging, and storage.
- Transportation (Section 4.2)—Human Community: Operation impacts are related to transfer of the currently stored SNF at INTEC, a distance of approximately 700 m [2,300 ft], to the proposed Idaho Spent Fuel Facility. Shipments would be made in U.S. Department of Energy (DOE)-supplied casks loaded on trailers. Movement of the SNF within the proposed Idaho Spent Fuel Facility would be conducted in accordance with the DOE procedures and orders for SNF transfers within the INEEL complex.
- Geology and Soils (Section 4.3)—Resource: Construction-related impacts to soil would occur on the 3.2-ha [8-acre] site and, to some extent, on the 4.1-ha [10-acre] laydown area. Excavation, earthmoving, and grading would occur on the 3.2-ha [8-acre] site. There is no contamination at the site above regulatory limits. No construction or operation impacts would occur on mineral deposits or unique geological resources.
- Water Resources—Water Quality (Section 4.4.1)—Resource: Construction phase impacts would be minimal to both surface water quality and groundwater quality. A storm water pollution prevention plan will be implemented. The proposed site is 140–146 m [460 to 480 ft] above the Snake River Plain Aquifer. Water used for construction phase dust control would evaporate or seep into surface soils. No new groundwater wells or percolation ponds would be required.
- Water Resources—Water Use (Section 4.4.2)—Resource: During the first year of construction, approximately 1.5 million L [396,000 gal] of water would be used for dust suppression, with an estimated additional 1.91 million L [505,000 gal] for concrete production at the site. During the second year of construction, it is estimated that water needs would be reduced by half. Drinking water use during operation would be nearly 141,950 L/mo [37,500 gal/mo]. These two amounts are a small fraction of the

Summary of Environmental Consequences

- 1 7.4 billion L [2.0 billion gal] used annually at the INEEL and the annual withdrawal of
2 43 billion L [11.4 billion gal] permitted by the DOE/State of Idaho Water Rights
3 Agreement. Wastewater treatment requirements would be met via existing
4 INTEC facilities.
- 5
- 6 • Ecological (Section 4.5)—Ecosystem: Minimal impacts from the construction and
7 operation of the facility would be anticipated. There are no wetlands or habitats for
8 threatened or endangered plant or animal species at the 3.2-ha [8-acre] site or 4.1-ha
9 [10-acre] laydown area. Secondary impacts on wildlife from noise and various human
10 activities would also be minimal.
- 11
- 12 • Air Quality (Section 4.6)—Resource: Construction-related fugitive dusts and exhaust
13 emissions would be temporary and highly localized. With construction phase watering,
14 the fugitive dusts and particulates would be about 8.2 metric tons [9 tons]; this is a small
15 amount in relation to the INEEL emission inventory for particulates. No impacts to
16 radiological air quality are anticipated from construction activities. During operation,
17 there would be no chemical air discharges, and the vehicular exhausts would be small
18 and within limitations. Therefore, no significant impacts to nonradiological air quality are
19 anticipated. Facility operations would not be expected to result in the atmospheric
20 discharge of significant amounts of gaseous radioactive effluents. The facility would be
21 fully enclosed and includes a special ventilation system along with high efficiency
22 particulate air (HEPA) filters. Monitoring of stack emissions for particulate radionuclides,
23 iodine-129, and tritium would be used to identify any releases.
- 24
- 25 • Noise (Section 4.7)—Resource: Construction phase noise levels would be typical of
26 industrial areas; further, the noise would be temporary and highly localized. Noise from
27 construction and operation traffic would be minimal in relation to existing traffic noise
28 levels in the INTEC area. Potential noise levels from operations would be less than
29 those from construction. Hearing protection will be required for workers per
30 29 CFR 1910.95. No unique noise receptors are in the vicinity of the proposed Idaho
31 Spent Fuel Facility. Therefore, noise impacts are not expected to be significant.
- 32
- 33 • Historical, Cultural, and Paleontological (Section 4.8)—Human Community: There are
34 no known historical and cultural resources, or paleontological resources, within the
35 3.2-ha [8-acre] site and the 4.1-ha [10-acre] laydown area. Thirty-eight buildings and
36 structures within INTEC are potentially eligible for the National Register of Historic
37 Places, but only one of these (CPP-603) is near the area that would be affected by the
38 construction of the proposed facility and the transfer of SNF. The proposed facility
39 would not introduce a built environment in a pristine natural setting. There are potential
40 cumulative effects from withdrawal of access to the proposed 7.3-ha [18-acre] site by the
41 Shoshone-Bannock Tribes, however, these lands are already contained within the
42 limited access buffer area around INTEC.
- 43
- 44 • Visual/Scenic (Section 4.9)—Human Community: Because of its smaller scale in
45 relation to the adjacent INTEC facilities, construction and operation of the proposed
46 Idaho Spent Fuel Facility would not cause visual impacts to the Bureau of Land
47 Management (BLM) Class IV rating for the INTEC area. Fugitive dusts and exhaust
48 emissions from construction would not impair the BLM Class III rating of lands adjacent

1 to INEEL nor would the minimal-to-nil releases of radioactive particulates and gases
2 during operations. No significant visual or scenic impacts are anticipated.

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- 4 • Socioeconomic (Section 4.10)—Human Community: Construction of the proposed
5 Idaho Spent Fuel Facility is scheduled to last approximately 2 years. This phase would
6 employ a maximum of 250 workers, approximately 3 percent of the current INEEL
7 workforce of 8,100. Because most of the workers would likely come from the existing
8 INEEL workforce, the construction phase would not have significant socioeconomic
9 effects on population growth, employment levels, housing, and infrastructure. For the
10 first 4 years of facility operations, when fuel receipt and packaging occurs, about
11 60 employees would be required. Storage operations beyond the first 4 years will likely
12 require fewer staff. Most operations personnel would be from the local INEEL
13 workforce. Again, no significant impacts are expected on the various features of the
14 socioeconomic environment.
- 15
- 16 • Environmental Justice (Section 4.11)—Human Community: The minority population
17 near INEEL is predominately Hispanic, American Indian, and Asian, with these groups
18 composing approximately 7 percent of the population within a 80-km [50-mi] radius. The
19 low-income population in this same area comprises approximately 14 percent of the
20 population. Special concerns related to the Shoshone–Bannock Tribes have been
21 identified numerous consultations between tribal officials and INEEL officials. Two
22 recent programmatic impact studies for INEEL concluded that environmental justice
23 impacts are not significant (DOE, 1995, 2002), as did the recent EIS on the independent
24 SNF storage installation for the Three-Mile Island Unit 2 Spent Fuel (NRC, 1998).
25 Accordingly, because of the small socioeconomic impacts of the proposed Idaho Spent
26 Fuel Facility, in general, and the lack of identified disproportionate impacts in the three
27 recent impact studies, it is likely that no disproportionately high and adverse human
28 health or environmental effects will occur on minority and low-income populations.
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- 30 • Public and Occupational Health and Safety (Section 4.12)—Human Community:
31 Potential impacts were examined for normal, off-normal, and accident conditions. For
32 normal operating conditions, no chemical discharges are planned from the proposed
33 facility, and a health and safety program would be in place for the workers. The primary
34 pathway for off-site radiation exposure to the public would be from atmospheric
35 emissions of radioactive particulates, iodine-129, tritium, and a few other radionuclides.
36 Iodine-129 and tritium contribute approximately 80 percent of the total dose. The
37 estimated annual dose for the maximally exposed individual at the southern boundary of
38 INEEL is 3×10^{-7} mSv [3×10^{-5} mrem] from the proposed Idaho Spent Fuel Facility;
39 from all nearby facility operations, the dose is less than 0.0032 mSv [0.32 mrem]. The
40 regulatory annual dose limit is 0.1 mSv [10 mrem], and the natural background annual
41 radiation is 3.6 mSv [360 mrem] in this general area. Therefore, public radiation impacts
42 during normal operation of the proposed Idaho Spent Fuel Facility would be minimal and
43 insignificant. Occupational radiological doses from the construction of the proposed
44 Idaho Spent Fuel Facility would be less than 0.0032 mSv [0.32 mrem] annually to
45 construction workers. The NRC annual occupational limit is 50 mSv [5,000 mrem], and
46 the annual natural background radiation dose is 3.6 mSv [360 mrem]. The occupational
47 dose to SNF-handling workers would be 9.1 mSv [910 mrem] annually, with the NRC
48 annual occupational limit being 50 mSv [5,000 mrem]. The annual radiation dose to all
49 workers within an 8-km [4.8-mi] radius is 6.68×10^{-5} mSv [6.68×10^{-3} mrem]. Detailed

Summary of Environmental Consequences

1 analyses of the radiation doses from off-normal events and accidents at the proposed
2 Idaho Spent Fuel Facility are in Foster Wheeler Environmental Corporation (FWENC)
3 (2001a). Further, analyses were also made of the public and occupational health and
4 safety impacts of external events such as flooding, aircraft impact, volcanic hazards,
5 seismic hazards, and extreme wind and wind-generated missiles. Design features and
6 operational practices are expected to minimize the public and occupational health and
7 safety impacts of these events and accidents.

- 8
9 • Waste Management (Section 4.13)—Resource: Small quantities of gaseous, liquid, and
10 solid low-level radioactive waste would be generated during the SNF receipt and
11 repackaging operations planned for the first 3 years at the proposed Idaho Spent Fuel
12 Facility. After repackaging and storing, no gaseous releases, or liquid or solid
13 radioactive wastes are anticipated to be generated on a regular basis at the proposed
14 facility. Less than 17,790 L [4,700 gal] of low-level liquid wastes would be annually
15 generated from decontamination activities. The INEEL Radioactive Waste Management
16 Complex has the capacity to handle the small quantities of the generated wastes during
17 the storage period for the repackaged SNF.

18 19 **8.2 Relationship Between Short-Term Uses and Long-Term Productivity**

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21 As discussed in Section 4.1 of this EIS, the proposed Idaho Spent Fuel Facility includes the
22 short-term use of up to 7.3 ha [18 acres] of previously disturbed, undeveloped land. This
23 includes the 3.2-ha [8-acre] tract where the proposed facility will be constructed and a
24 contiguous 4.1-ha [10-acre] construction laydown tract. The proposed action would result in
25 physical changes to the site, including construction of a new facility and grading and leveling to
26 prepare the site. Because these two areas are small compared with the 2,305 km² [890 mi²]
27 INEEL and the 101-ha [250-acre] INTEC facility adjacent to the proposed facility, the physical
28 changes are expected to be minor. These changes would restrict access to the land during
29 construction and operation of the proposed Idaho Spent Fuel Facility. The restriction would not
30 affect the value of the land, because the property is classified as least productive, and access is
31 already limited. The site would be decontaminated and decommissioned to meet applicable
32 NRC standards at the end of facility use (see Sections 4.16 and 7.1.3). Therefore, it is
33 anticipated that impacts from the proposed action would not lead to any impacts on the
34 long-term productivity of the land.

35 36 **8.3 Irreversible and Irretrievable Commitment**

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38 The construction and operation of the proposed Idaho Spent Fuel Facility would consume
39 irretrievable amounts of electrical energy, fuel (see Table 7-2), and miscellaneous chemicals.
40 Also, there would be an indefinite commitment of concrete, metals, plastic, lumber, sand, gravel,
41 and a fraction of the water used in construction. Transfer of SNF into new storage containers
42 and placement in the vault will require consumable materials such as filters, welding supplies,
43 and other housekeeping materials. Storage operations would require materials such as HEPA
44 filter media and other housekeeping materials. Scarce or strategic material would not be used
45 for the construction of the facility. When the proposed Idaho Spent Fuel Facility ceases
46 operation, DOE would be required to submit an updated decontamination and decommissioning
47 plan for NRC review and approval. NRC will require the site be cleaned to applicable standards
48 at that time. The current conceptual decontamination and decommissioning plan for the facility

1 is described in the FWENC license application for the proposed action (FWENC, 2001b) and
2 discussed in Sections 4.16 and 7.1.3 of this EIS.

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4 **8.4 References**

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6 DOE. DOE/EIS-0287-F, "Idaho High-Level Waste and Facilities Disposition Final
7 Environmental Impact Statement." Idaho Falls, Idaho: DOE, Idaho Operations Office. 2002.

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9 ———. DOE/EIS-0203-F, "Department of Energy Programmatic Spent Nuclear Fuel
10 Management and Idaho National Engineering Laboratory Environmental Restoration and Waste
11 Management Programs Final Environmental Impact Statement." Idaho Falls, Idaho: DOE,
12 Idaho Operations Office. 1995.

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14 FWENC. "Safety Analysis Report, Idaho Spent Fuel Facility." NRC Docket No. 72-25.
15 ISF-FW-RPT-0033. Morris Plains, New Jersey: FWENC. 2001a.

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17 ———. "License Application, Idaho Spent Fuel Facility." NRC Docket No. 72-25.
18 ISF-FW-RPT-0127." Morris Plains, New Jersey: FWENC. 2001b.

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20 NRC. NUREG-1626, "Final Environmental Impact Statement for the Construction and
21 Operation of an Independent Spent Fuel Storage Installation to Store the Three-Mile Island
22 Unit 2 Spent Fuel at the Idaho National Engineering and Environmental Laboratory."

23 Washington, DC: NRC. March 1998.