

## 2 ALTERNATIVES

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3 During the past 40 years, the U.S. Department of Energy (DOE) and its predecessor agencies  
4 have stored spent nuclear fuel (SNF) at the DOE facilities around the country, including the  
5 Idaho National Engineering and Environmental Laboratory (INEEL). The SNF has been stored  
6 in wet (in SNF pools/canals) or dry (in casks, vaults, or dry wells) facilities. In 1991, the State of  
7 Idaho initiated litigation against DOE related to the environmental impacts of SNF storage and  
8 transportation. During this litigation, DOE issued a record of decision (DOE, 1995a, 1996a)  
9 based on the Programmatic Spent Nuclear Fuel Management and INEEL Environmental  
10 Restoration and Waste Management Programs Final Environmental Impact Statement [referred  
11 to herein as the DOE programmatic SNF environmental impact statement (EIS)]. Volume 2 of  
12 the DOE programmatic SNF EIS dealt with the INEEL environmental restoration and waste  
13 management program (DOE, 1995b).

14  
15 The DOE effort to manage the national issue of SNF involved evaluation of many national  
16 alternatives: No Action, Decentralization, 1992/1993 Planning Basis, Regionalization, and  
17 Centralization. The detailed information on each alternative is provided in DOE programmatic  
18 SNF EIS (DOE, 1995b). The DOE programmatic SNF EIS identified Regionalization by Nuclear  
19 Fuel Type as the preferred national SNF management alternative. Consistent with these  
20 national alternatives, alternatives considered for the INEEL environmental restoration and waste  
21 management program, found in Volume 2 of the DOE programmatic EIS, included No Action;  
22 Ten-Year Plan; Minimum Treatment, Storage, and Disposal; and Maximum Treatment, Storage,  
23 and Disposal. The Ten-Year Plan was identified as the preferred alternative for SNF  
24 management at the INEEL site.

25  
26 The record of decision (DOE, 1995a, 1996a) also designated Regionalization by Fuel Type as  
27 the chosen programmatic alternative for management of SNF. And, this record of decision  
28 announced the DOE decision to implement a modified version of the Ten-Year Plan, including  
29 construction of a dry fuel storage facility and other site-specific environmental restoration and  
30 waste management actions at INEEL.

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32 In accordance with the DOE programmatic SNF EIS and the record of decision and as part of  
33 the implementation of the 1995 Settlement Agreement, DOE requested proposals from the  
34 private sector to design, license, construct, and operate an SNF dry storage facility. On May 19,  
35 2000, DOE awarded a contract to Foster Wheeler Environmental Corporation (FWENC)  
36 (hereinafter, the applicant). One contract requirement was that FWENC obtain a U.S. Nuclear  
37 Regulatory Commission (NRC) license to receive, possess, transfer, and store SNF at the  
38 proposed SNF dry storage facility.

### 2.1 Process Used to Formulate Alternatives

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42 During the scoping process conducted to prepare this EIS, NRC solicited public input to help  
43 define alternatives to the proposed action by placing announcements in the *Federal Register*  
44 and local newspapers. Announcements and additional information on the proposed action were  
45 also posted on the NRC Idaho Spent Fuel Facility web page. During the public comment  
46 period, NRC received about 15 written comments from two organizations, none of which  
47 provided suggestions for alternatives beyond the proposed action and the  
48 no-action alternatives.

## Alternatives

1 NRC reviewed the alternatives documented in the DOE programmatic SNF EIS (DOE, 1995b)  
2 and in the accompanying records of decision (DOE, 1995a, 1996a). NRC also examined  
3 alternatives proposed for construction and operation of the Three-Mile Island Unit-2  
4 independent spent fuel storage installation (ISFSI) (NRC, 1998) which is located within the  
5 Idaho Nuclear Technology and Engineering Center (INTEC), as alternatives to the proposed  
6 Idaho Spent Fuel Facility. These alternatives were evaluated by NRC against the programmatic  
7 needs of the DOE SNF management program at INEEL and against the terms of the 1995  
8 Settlement Agreement. The alternatives evaluated or eliminated are discussed next.

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### 10 **2.2 No-Action Alternative**

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12 The no-action alternative would be to not build the proposed Idaho Spent Fuel Facility.  
13 According to the no-action alternative, NRC would not approve the license application to  
14 receive, possess, transfer, and store SNF at the proposed Idaho Spent Fuel Facility. Hence,  
15 DOE would continue to store the SNF from the Peach Bottom Unit 1 High-Temperature,  
16 Gas-Cooled Reactor, the Shippingport Light Water Breeder Reactor, and the training, research,  
17 and isotope reactors built by General Atomics (TRIGA reactor) SNF at their current locations  
18 within INTEC (see Figure 1-1). Remaining TRIGA reactor fuel will continue to be shipped and  
19 stored at INEEL as identified in the previous DOE records of decision (DOE, 1996a,b). Other  
20 SNF activities would continue as described in DOE (1995a,b). Other activities at the INTEC  
21 facility will continue as described in DOE (2002).

22

23 Short-term impacts of not constructing the proposed Idaho Spent Fuel Facility would be  
24 negligible. Current storage and fuel-handling facilities at INTEC, however, would be open and  
25 operational longer than planned. Ultimately, existing facilities would need to be modified or  
26 similar facilities to those described in the proposed action would need to be built. For example,  
27 the current storage location of Shippingport SNF at the INTEC Irradiated Spent Fuel Storage  
28 Facility (CPP-603) would be modified to expand the hot cell and add a load-out facility in lieu of  
29 the availability of the proposed Idaho Spent Fuel Facility. Long-term impacts would be similar to  
30 the proposed Idaho Spent Fuel Facility, because the SNF must be repackaged before shipment  
31 from INEEL to a geologic repository can occur.

32

### 33 **2.3 Applicant's Proposed Action Alternative**

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35 The applicant's proposed action is to (i) receive SNF generated at Peach Bottom Unit 1, the  
36 Shippingport Light Water Breeder Reactor, and various TRIGA reactors from DOE; (ii) transfer  
37 SNF from the existing DOE storage facilities into new storage containers; and (iii) place the  
38 storage containers in a redundant confinement storage tube system consisting of a vault  
39 structure that provides radiological shielding and passive natural convection air cooling  
40 (FWENC, 2001a,b,c). The tallest structures would be about 24 m [80 ft]. DOE would transfer  
41 the SNF from its existing storage locations in INEEL to the proposed Idaho Spent Fuel Facility.  
42 The SNF transfer would occur completely within the boundaries of INTEC (Figure 2-1) and  
43 would be conducted in accordance with INEEL procedures and DOE orders. Movement and  
44 transfer of SNF within the proposed Idaho Spent Fuel Facility site would be conducted  
45 according to the provisions of 10 CFR Part 72. As described by FWENC, the proposed action  
46 can be divided into three major activities: (i) facility construction, (ii) fuel-handling operations,  
47 and (iii) storage operations. Additional aspects of the proposed action include monitoring,  
48 emergency planning, and quality assurance.

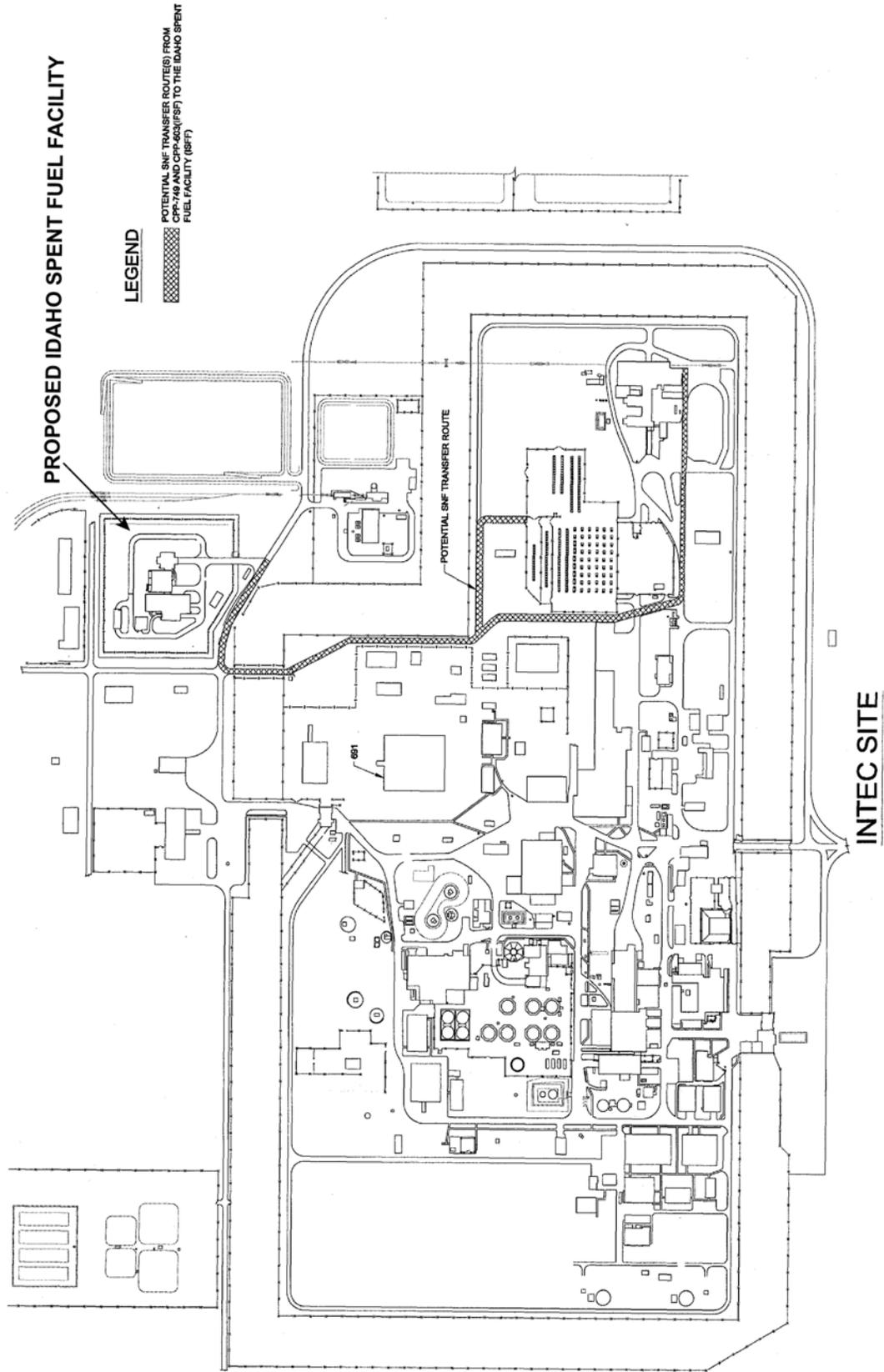


Figure 2-1. Location of the Proposed Idaho Spent Fuel Facility (Modified from FWENC, 2003)

## Alternatives

### 1 **2.3.1 Facility Construction**

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3 If constructed, the proposed Idaho Spent Fuel Facility will be located on a previously disturbed  
4 site adjacent to INTEC (Figure 2-1). INTEC occupies about 101 ha [250 acres] of the south-  
5 central portion of the INEEL and is 68 km [42 mi] west of Idaho Falls, Idaho. The proposed  
6 Idaho Spent Fuel Facility site would occupy 3.2 ha [8 acres] adjacent to the southeast boundary  
7 of INTEC. In addition to the site, about 4.1 ha [10 acres] adjacent to the northeast corner of the  
8 site would be disturbed to provide a laydown area during construction. Mobile construction  
9 equipment will excavate the foundation and establish the facility grade. Explosives would not be  
10 used to establish below-grade areas. The facility would consist of a fully enclosed two-story  
11 building with three principal areas for cask receipt, fuel transfer operations, and fuel storage  
12 (Figure 2-2). The principal areas are connected by a below-grade tunnel designed to transfer  
13 fuel throughout the facility via shielded, rail-mounted trolleys. Support structures such as a  
14 warehouse, administrative offices, a guard house, a visitor center, and parking are also planned  
15 for the facility. During construction, equipment delivering cement and other construction  
16 materials would access the site. Construction is anticipated to last nearly 2 years  
17 (FWENC, 2001c).

18

### 19 **2.3.2 Fuel-Handling Operations**

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21 The proposed Idaho Spent Fuel Facility would be fully enclosed to allow year-round operations  
22 for receipt, packaging, and storage of SNF.

23

24 The Cask Receipt Area (Figure 2-2) would provide for transfer of incoming DOE transport casks  
25 from truck-mounted transporters to the rail-mounted trolley for movement into other areas within  
26 the proposed Idaho Spent Fuel Facility. The two-story Cask Receipt Area would use a single-  
27 failure-proof crane to lift the transport cask from its transport vehicle and place it on a rail-  
28 mounted trolley for transfer within the proposed facility. The rail-mounted trolley would move in  
29 an enclosed Transfer Tunnel that connects the Cask Receipt Area with the Transfer and  
30 Storage Areas.

31

32 The Transfer Area (Figure 2-2) comprises the Fuel Packaging Area and the Canister Closure  
33 Area. These areas would provide the facilities for remote-controlled unloading of the DOE  
34 transport cask. After removal from the DOE transfer cask, the SNF would be inspected,  
35 inventoried, and repackaged into new storage containers designed to be compatible with future  
36 transportation and disposal requirements. The containers would be welded closed, vacuum  
37 dried, and backfilled with helium to provide an inert storage environment for the SNF. SNF  
38 handling would be performed entirely by remote manipulation using a fuel-handling machine  
39 and master/slave manipulators. The Transfer Area would be equipped with shielded windows  
40 and a closed-circuit television system to aid in remote operations. Fuel-handling operations are  
41 anticipated to last about 3 years.

42

### 43 **2.3.3 Storage Operations**

44

45 The Storage Area (Figure 2-2) would provide for the interim dry storage of the SNF. The  
46 Storage Area would include reinforced concrete storage vaults covering an area 24 × 15 m  
47 [79 × 49 ft]. The storage vaults would provide passively cooled housing for 246 below-grade  
48 storage tubes in which the containers would be placed (Figure 2-3). The area above the  
49 concrete vault would be enclosed in a two-story, metal-sided building to facilitate year-round

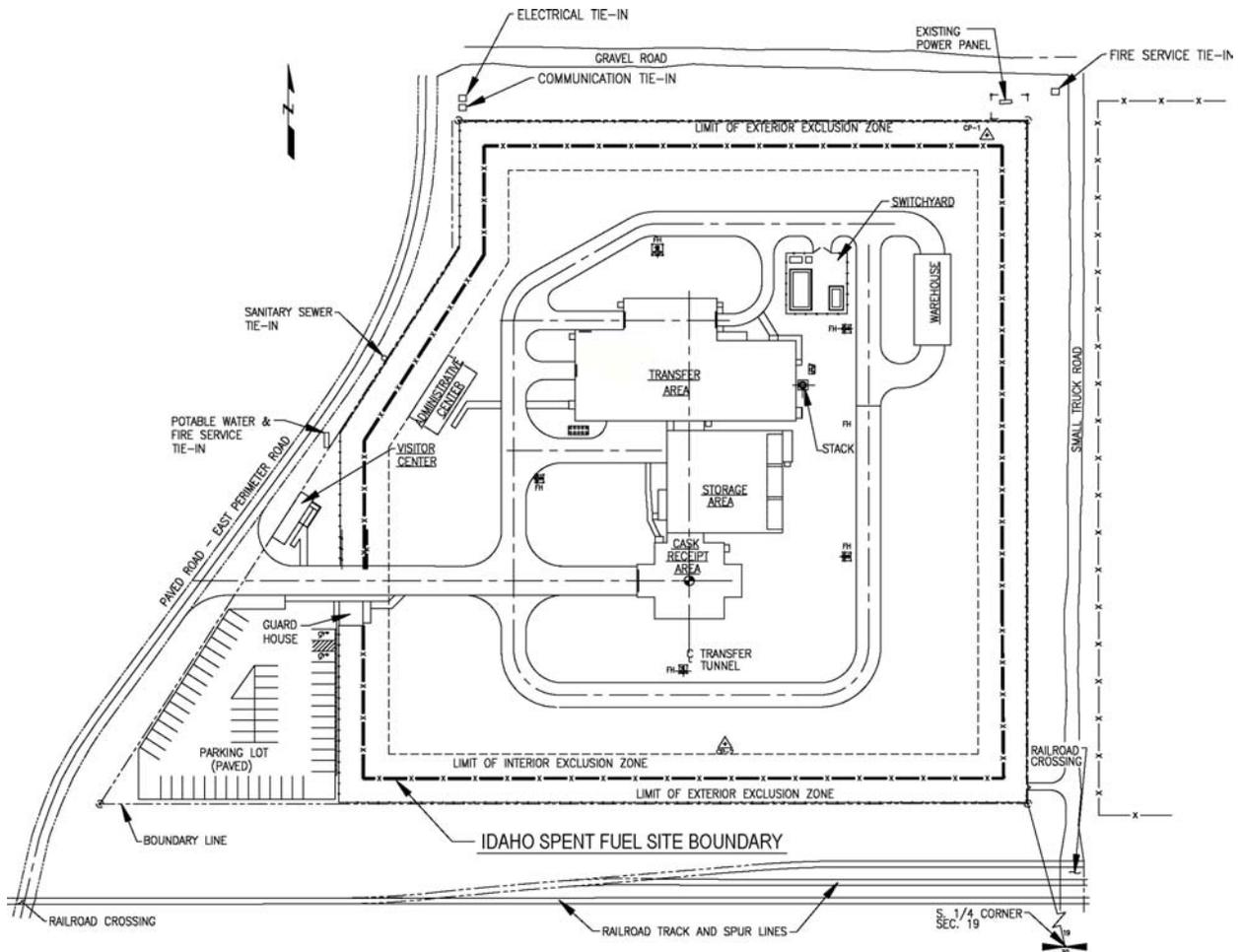
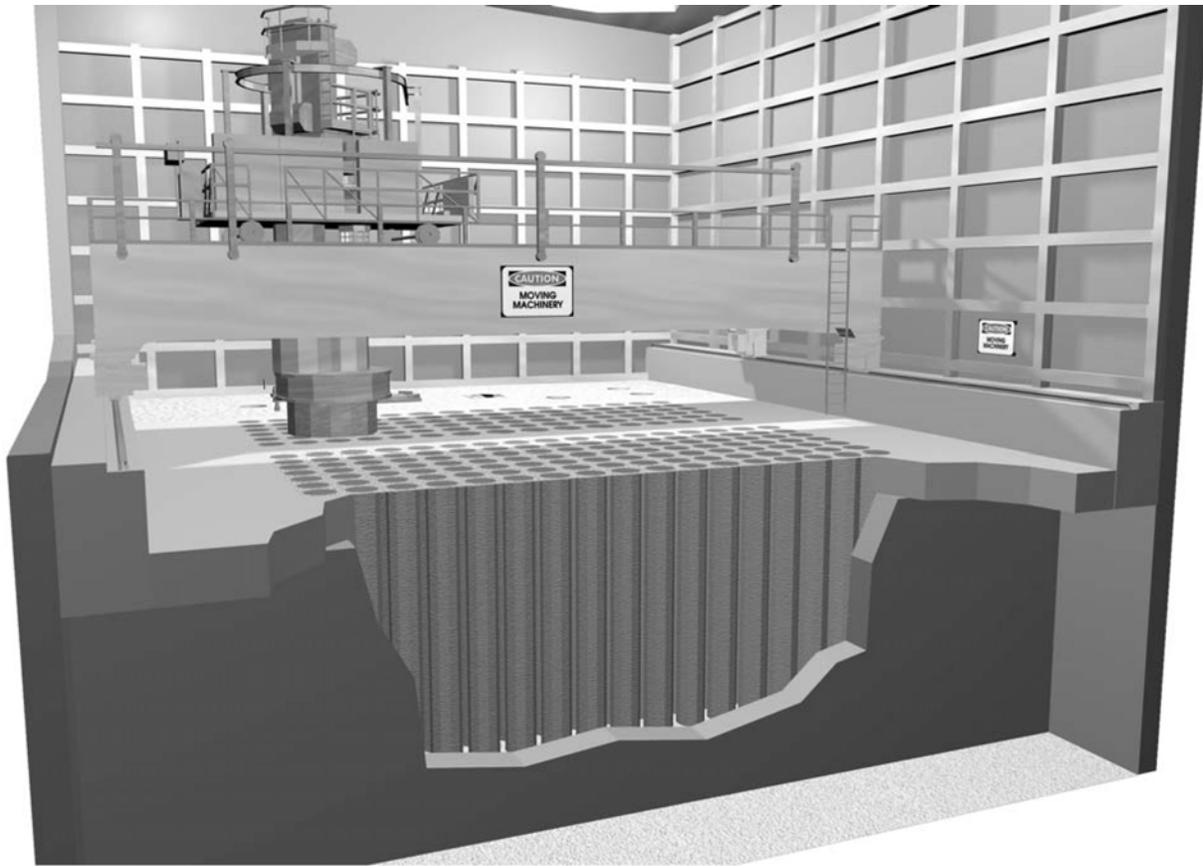


Figure 2-2. Site Plan for the Proposed Idaho Spent Fuel Facility (Modified from FWENC, 2001b)

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**Figure 2-3. Storage Vault Configuration for the Proposed Idaho Spent Fuel Facility (Modified from FWENC, 2001b)**

1 SNF loading operations. Each storage tube would provide interim storage for a single  
 2 container. A canister-handling machine would move the individual containers from the Transfer  
 3 Tunnel to the storage tube location. After the container is lowered into a storage tube, the  
 4 storage tube would be sealed with a cover plate with dual metallic seals, and the air would be  
 5 evacuated. The storage tubes would then be filled with an inert gas to further reduce the  
 6 potential of corrosion during storage.

7  
 8 Material balances and SNF inventories at the proposed Idaho Spent Fuel Facility would be used  
 9 to ensure safe container storage. Each container would be labeled with a unique identifier.  
 10 Information, including location, on all storage containers would be documented and kept with  
 11 other proposed Idaho Spent Fuel Facility records. Prior to any movement of a container,  
 12 established procedures would require a review of the documentation to help ensure the proper  
 13 container is being moved. In addition, a physical inventory of the containers at the proposed  
 14 Idaho Spent Fuel Facility would be performed in accordance with NRC requirements to ensure  
 15 all containers are untampered with and are in their assigned locations. Records of the results of  
 16 the current inventory, material control, and accounting procedures would be maintained in  
 17 accordance with requirements of 10 CFR Part 72 and retained until termination of the  
 18 NRC license.

19  
 20 The SNF would remain in storage at the proposed Idaho Spent Fuel Facility until a high-level  
 21 waste (HLW) geologic repository becomes available. The storage containers would then be  
 22 removed from the facility, loaded into a transportation cask (to be licensed in accordance with  
 23 10 CFR Part 71), and transported offsite by DOE. Because of uncertainties in scheduling fuel  
 24 shipment to a geologic repository, it is difficult to place a time limit on the duration of fuel  
 25 storage at the proposed facility. The terms of the 1995 Settlement Agreement call for shipment  
 26 of fuel by 2035, so storage may be as long as about 27 years. After removal, the facility would  
 27 be decontaminated and decommissioned in accordance with the NRC regulations.

28  
 29 **2.3.4 Monitoring and Emergency Response**

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 31 Process and effluent radiation monitoring for the proposed Idaho Spent Fuel Facility would  
 32 include criticality monitoring, area radiation monitoring, radiation signature monitoring,  
 33 continuous air monitoring, and record sample air monitoring. Because there would be no liquid  
 34 releases, the only effluent radioactive release point would be the exhaust stack. Continuous air  
 35 monitors would be used to monitor the general level of airborne material in work areas and to  
 36 detect breakthrough of the high efficiency particulate air filters downstream of the Fuel  
 37 Packaging Area. Effluent monitoring would consist of exhaust stack sampling for particulate  
 38 radionuclides iodine-129 and tritium. Any undue rise in radiation levels would trigger an alarm  
 39 to signal a prompt evacuation of the immediate area. All monitoring would be conducted in  
 40 accordance with radiation protection standards in 10 CFR Part 20 (FWENC, 2001a, Section 6).

41  
 42 Primary emergency response at the proposed Idaho Spent Fuel Facility would be provided by  
 43 DOE and its qualified management and operating contractor staff located at INEEL. In  
 44 accordance with the requirements of 10 CFR Part 72, FWENC must have an approved  
 45 emergency plan. FWENC has submitted an emergency plan that will be reviewed by NRC in  
 46 preparing the safety evaluation report for the proposed Idaho Spent Fuel Facility  
 47 (FWENC, 2001d).

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## Alternatives

### 1 **2.3.5 Quality Assurance**

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3 In compliance with the requirements of 10 CFR Part 72, Subpart G, activities associated with  
4 design, fabrication, construction, testing, operation, modification, and decommissioning of the  
5 structures, systems, and components of the proposed Idaho Spent Fuel Facility would be  
6 conducted in accordance with an approved quality assurance program. FWENC would ensure  
7 the provisions of the Quality Program Plan and its implementation are understood by the  
8 personnel involved in their execution (FWENC, 2001b, Section 11). FWENC would also  
9 maintain an adequate complement of trained and certified personnel prior to receipt of the SNF  
10 for storage and throughout the different phases of the project.

### 11 **2.4 Other Reasonable Alternatives**

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14 The proposed action is consistent with both the programmatic objectives and the preferred  
15 alternative identified in earlier DOE National Environmental Policy Act (NEPA) analyses  
16 (DOE, 1995a,b). Also, no additional alternatives to the proposed action were identified during  
17 the public scoping process. The proposed action and the no-action alternatives are considered  
18 to bound the impacts of storing the designated SNF. Based on these considerations, no other  
19 alternatives are reasonably likely to exceed these impacts or meet the DOE programmatic  
20 obligations from the 1995 Settlement Agreement.

### 21 **2.5 Alternatives Considered but Eliminated**

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23  
24 In preparing its programmatic EIS for SNF management at the INEEL (DOE, 1995b), DOE  
25 considered a number of alternatives to dry SNF storage at INEEL:

- 26  
27 • No Action;  
28 • The Ten-Year Plan;  
29 • Minimum Treatment, Storage, and Disposal; and  
30 • Maximum Treatment, Storage, and Disposal.

31  
32 Based on these considerations, the DOE record of decision (DOE, 1995a, 1996a) selected a  
33 modified Ten-Year Plan for SNF management at the INEEL as the preferred alternative for  
34 meeting programmatic objectives. The modified Ten-Year Plan was considered to be consistent  
35 with the terms of the 1995 Settlement Agreement and included the construction of dry interim  
36 storage facilities similar to the proposed action (DOE, 1995b, Volume 2, Part B, Appendix C).  
37 The proposed action considered in this EIS is a part of the modified Ten-Year Plan alternative  
38 documented in that DOE 1995 record of decision.

39  
40 In 1998, DOE obtained an NRC license to construct and operate an ISFSI at the INTEC facility  
41 for fuel debris from Three-Mile Island Unit 2. In fulfilling NEPA requirements of 10 CFR Part 51,  
42 NRC developed an EIS(NRC, 1998). That EIS was prepared by adopting previous DOE NEPA  
43 analyses (DOE, 1995b, 1997). Several alternatives to dry-cask storage were considered that  
44 are relevant to the proposed action:

- 45  
46 • Construct New Wet Storage;  
47 • Store Three-Mile Island Unit 2 Fuel in Existing INTEC Storage Systems;

- 1 • Construct an ISFSI Test Area North; and
- 2 • Construct an ISFSI at a Point Removed from Above the Snake River Plain Aquifer.

3  
 4 These alternatives were eliminated from consideration on the basis of not meeting the  
 5 programmatic objectives for fuel consolidation at INTEC documented in the DOE record of  
 6 decision (DOE, 1995a, 1996a).

7  
 8 Similar to the Three-Mile Island Unit 2 ISFSI, the proposed Idaho Spent Fuel Facility is part of  
 9 the DOE effort to meet the terms of the 1995 Settlement Agreement. In developing design  
 10 criteria for a dry ISFSI at INEEL, DOE specified operational performance characteristics and  
 11 specific design criteria such as container dimensions, year-round operation, storage containers  
 12 that can be transported by truck or rail, personnel and public exposure limits, and minimization  
 13 of decommissioning activities (FWENC, 2001a). In evaluating design approaches, DOE  
 14 considered both cost and value to the government. Based on these objectives and criteria,  
 15 DOE selected the FWENC design for the proposed Idaho Spent Fuel Facility.

16  
 17 Dry fuel storage is the alternative preferred by DOE for SNF consolidation and management at  
 18 INEEL. Other alternatives either do not meet programmatic objectives or do not meet the terms  
 19 of the 1995 Settlement Agreement. Based on previous DOE and NRC NEPA analyses (DOE,  
 20 1995b; NRC, 1998) and comments received during the public scoping period, the proposed  
 21 action alternative and the no-action alternatives are likely to bound the impacts of dry fuel  
 22 storage at INEEL, and only these alternatives are evaluated in this EIS.

23

24 **2.6 Comparison of the Predicted Environmental Impacts**

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26 A more detailed evaluation of the environmental impacts of the proposed action and the  
 27 no-action alternative is presented in Section 4 of this EIS. The impacts are summarized in  
 28 Table 2-1.

29

30 **2.7 Preliminary Recommendation Regarding the Proposed Action**

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32 After weighing the costs and benefits of the proposed action and comparing alternatives (see  
 33 Sections 2.6, 4.15, and 7 of this EIS), the NRC staff, in accordance with 10 CFR 51.71(e), set  
 34 forth their preliminary NEPA recommendation regarding the proposed action. The NRC staff  
 35 recommend that, unless safety issues mandate otherwise, the action called for is the issuance  
 36 of the proposed license to FWENC. In this regard, the NRC staff preliminarily conclude (i) the  
 37 applicable environmental monitoring program described in Section 6 and (ii) the proposed  
 38 mitigation measures discussed in Section 5 would eliminate or substantially lessen any potential  
 39 adverse environmental impacts associated with the proposed action.

40

41 The NRC staff have preliminarily concluded the overall benefits of the proposed Idaho Spent  
 42 Fuel Facility outweigh the disadvantages and costs, based on consideration of the following:

43

- 44 • The proposed Idaho Spent Fuel Facility will have small-to-negligible impacts on the  
 45 physical environment and human communities in the vicinity. Long-term impacts of the  
 46 no-action alternative are likely to be similar to the impacts of the proposed action.
- 47  
 48 • The proposed action is designed to support the INEEL mission and comply with  
 49 agreements and commitments negotiated by DOE, including the 1995 Settlement

1 **Table 2-1. Summary of Environmental Impacts for the Proposed Idaho Spent Fuel Facility and the No-Action Alternative**

	<b>Impacts</b>	
<b>Affected Environment</b>	<b>Proposed Idaho Spent Fuel Facility</b>	<b>No-Action Alternative<sup>a</sup></b>
4 Land Use	SMALL. Construction activities to occur on a 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 the southeast corner of INTEC and have been previously disturbed by other construction activities and land uses. Operational impacts include restricted access to the 3.2-ha [8-acre] facility site and use of the site for SNF receiving, processing, and storage.	NO IMPACT. No impacts would occur because SNF would continue to be stored at existing facilities. There would be no construction or operational activities, and the land would continue to be used as a restricted access construction laydown area.
5 Transportation	SMALL. Operational impacts are related to transfer of the SNF from current storage facilities at INTEC, a maximum distance of approximately 700 m [2,300 ft] to the proposed Idaho Spent Fuel Facility, and shipment of the remaining TRIGA fuel to INEEL for storage at the proposed Idaho Spent Fuel Facility. On-site transfers will be made in DOE-supplied casks loaded on trailers and managed in accordance with DOE orders and procedures.	NO IMPACT. No impacts would occur because SNF would continue to be stored at existing facilities. No fuel transfers would occur. TRIGA fuel would continue to be shipped to INEEL for storage in existing facilities.
6 Geology and Soil	SMALL. Construction-related impacts to soil will 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 will occur on the 3.2-ha [8-acre] site. There is no soil contamination at the site above regulatory limits. No construction or operational impacts will occur on known mineral deposits or unique geological resources.	NO IMPACT. No impacts would occur because SNF would continue to be stored at existing facilities. There would be no construction or operational activities, and the land would continue to be used as a restricted access construction laydown area.
7 Water Quality	SMALL. Construction phase impacts will be minimal to both surface water quality and groundwater quality. A storm water pollution prevention plan is in effect at INEEL. The proposed site is 140 to 146 m [460 to 480 ft] above the Snake River Plain Aquifer. Water used for construction phase dust control will evaporate or seep into surface soils. No new groundwater wells or percolation ponds will be required. There are no planned liquid discharges from the facility.	NO IMPACT. No impacts would occur because SNF would continue to be stored at existing facilities. There would be no construction of new facilities, and water usage would continue at current rates.
8 Water Use	SMALL. During the first year of construction, approximately 1.5 million L [396,000 gal] of water will be used for dust suppression, with an additional estimated 1.91 million L [505,000 gal] estimated for concrete production at the site. During the second year of construction, it is estimated that water needs will be reduced by half. Drinking water usage during operation will be approximately 141,950 L/mo [37,500 gal/mo]. These amounts are a small fraction of the 7.4 billion L [2.0 billion gal] used annually at the INEEL and the annual withdrawal of 43 billion L [11.4 billion gal] permitted by the DOE/State of Idaho Water Rights Agreement. Wastewater treatment requirements will be met via existing INTEC facilities.	NO IMPACT. No impacts would occur because SNF would continue to be stored at existing facilities. There would be no construction of new facilities, and water quality would not be affected.

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Alternatives

Table 2-1. Summary of Environmental Impacts for the Proposed Idaho Spent Fuel Facility and the No-Action Alternative (continued)		
Affected Environment	Impacts	
	Proposed Idaho Spent Fuel Facility	No-Action Alternative <sup>a</sup>
Ecology	SMALL. Minimal impacts from the construction and operation of the facility are anticipated. There are no wetlands or habitats for threatened or endangered plant or animal species at the 3.2-ha [8-acre] site or 4.1-ha [10-acre] laydown area. Secondary impacts on wildlife from noise and various human activities are expected to be minimal, of short duration, or both .	NO IMPACT. No impacts would occur because SNF would continue to be stored at existing facilities. There would be no construction or operational activities, and the land would continue to be used as a restricted access construction laydown area.
Air Quality	SMALL. Construction-related fugitive dusts and exhaust emissions will be temporary and highly localized. With construction phase watering, the fugitive dusts and particulates will be approximately 8.2 metric tons [9 tons]; this is small in relation to the INEEL emission inventory for particulates. No impacts to radiological air quality are anticipated from construction activities. During operation, there will be no chemical air discharges, and the vehicular exhausts will be small and within limitations. Therefore, no significant impacts to nonradiological air quality are anticipated. Facility operations are not expected to result in the atmospheric discharge of significant amounts of gaseous radioactive effluents. The facility is fully enclosed and includes a special ventilation system along with HEPA filters. Monitoring of stack emissions for particulate radionuclides, iodine-129, and tritium will be used to identify any releases.	NO IMPACT. No impacts would occur because SNF would continue to be stored at existing facilities. There would be no construction or operational activities, and the land would continue to be used as a restricted access construction laydown area.
Noise	SMALL. Construction phase noise levels will be typical of industrial areas; further, they will be temporary and highly localized. Noise from construction and operational traffic will be minimal in relation to existing traffic noise levels in the INTEC area. Potential noise levels from operations will be less than those from construction. Hearing protection will be required for workers per 29 CFR 1910.95. No unique noise receptors are in the vicinity of the proposed Idaho Spent Fuel Facility site. Therefore, noise impacts are not expected to be significant.	NO IMPACT. No impacts would occur because SNF would continue to be stored at existing facilities. There would be no construction or operational activities, and the land would continue to be used as a restricted access construction laydown area.
Historical, Cultural, and Paleontological Resources	SMALL. There are no known historic, cultural resources, or paleontological resources within the 3.2-ha [8-acre] site and 4.1-ha [10-acre] laydown area. Thirty-eight buildings and structures within INTEC are potentially eligible for the National Register of Historic Places, although only two (CPP-603 and CPP-642) are close to the current storage location or proposed transfer routes. There are no plans for modification or demolition of either of these buildings. The proposed facility would not introduce a built environment into a pristine natural setting. There are potential cumulative effects from withdrawal of access to the proposed 7.3-ha [18-acre] site by the Shoshone and Bannock Tribes, but these lands are already contained within the limited access buffer area around the INTEC.	NO IMPACT. No impacts would occur because SNF would continue to be stored at existing facilities. There would be no construction or operational activities, and the land would continue to be used as a restricted access construction laydown area.

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**Table 2-1. Summary of Environmental Impacts for the Proposed Idaho Spent Fuel Facility and the No-Action Alternative (continued)**

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Affected Environment	Impacts	
	Proposed Idaho Spent Fuel Facility	No-Action Alternative <sup>a</sup>
Visual/Scenic Resources	SMALL. Due to its smaller scale in relation to the adjacent INTEC facilities, construction and operation of the proposed Idaho Spent Fuel Facility would not cause visual impacts to the BLM Class IV rating for the INTEC area. Fugitive dusts and exhaust emissions from construction would be localized and temporary and would not impair the BLM Class III rating of lands adjacent to INEEL, nor would the minimal to nil releases of radioactive particulates and gases during operations. No significant visual or scenic impacts are anticipated.	NO IMPACT. No impacts would occur because SNF would continue to be stored at existing facilities. There would be no construction or operational activities, and the land would continue to be used as a restricted access construction laydown area.
Socioeconomic	SMALL. The total population in 2000 in the 7-county region of influence was 250,365, and population in the region of influence is estimated to reach almost 269,000 by 2005 and 339,700 by 2025. In the 1990s, employment in the region of influence grew at an average annual rate of approximately 2.6 percent. The region of influence experienced the lowest unemployment rate in a decade in 2000—4.0 percent. This rate was lower than the 4.9 percent for the state, though rates varied widely in the region of influence (from 2.5 percent in Madison County to 5.0 percent in Bannock County). The proposed Idaho Spent Fuel Facility would employ a maximum of 250 construction workers during the 2-year construction period and 60 workers during the first 4 years of operations. These numbers are small relative to the total employment at INEEL; for example, in fiscal year 2001, INEEL accounted for 8,100 jobs, or approximately 6 percent of the total jobs in the region of influence. Finally, housing and key community services such as education, law enforcement, fire protection, and medical services do not appear to be overstressed in the region of influence, and the additional workers can be accommodated in the region.	SMALL. Negligible impacts would occur because SNF would continue to be stored at existing facilities. The land would continue to be used as a restricted access construction laydown area. Approximately 250 construction jobs and 60 operational jobs would not be created.
Environmental Justice	SMALL. The environmental justice study area was chosen to encompass an 80-km [50-mi] radius around INTEC. This area includes portions of the seven counties composing the region of influence for socioeconomics. The 2000 population within the 80-km [50-mi] radius was 203,165, including a minority population of 21,898 (11 percent). The low-income population was based on 1990 data because the 2000 data were not available. The 1990 population was 170,989, including 20,110 meeting the definition of low income (12 percent). Overall, impacts from the proposed Idaho Spent Fuel Facility are small and do not disproportionately affect minority and low-income populations.	NO IMPACT. No impacts would occur because SNF would continue to be stored at existing facilities. There would be no construction or operational activities, and the land would continue to be used as a restricted access construction laydown area.

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Table 2-1. Summary of Environmental Impacts for the Proposed Idaho Spent Fuel Facility and the No-Action Alternative (continued)		
Affected Environment	Impacts	
	Proposed Idaho Spent Fuel Facility	No-Action Alternative <sup>a</sup>
Public and Occupational Health and Safety	<p>SMALL. Potential impacts were examined for normal, off-normal, and accident conditions. For normal operating conditions, no chemical discharges are planned, and a health and safety program will be in place for the workers. The primary pathway for off-site radiation exposure to the public is from atmospheric emissions of radioactive particulates, iodine-129, tritium, and a few other radionuclides. Iodine-129 and tritium contribute approximately 80 percent of the total dose. The estimated annual dose for the maximally exposed individual at the southern boundary of INEEL is <math>3 \times 10^{-7}</math> mSv [<math>3 \times 10^{-5}</math> mrem] from the proposed Idaho Spent Fuel Facility; from all nearby facility operations (including the proposed Idaho Spent Fuel Facility), the dose is less than 0.0032 mSv [0.32 mrem]. The regulatory annual dose limit is 0.1 mSv [10 mrem] and the natural background annual radiation is 3.6 mSv [360 mrem] in this general area. Therefore, public radiation impacts during normal operation of the proposed Idaho Spent Fuel Facility are minimal and insignificant. Occupational radiological doses from the construction of the proposed Idaho Spent Fuel Facility will be less than 0.0032 mSv [0.32 mrem] annually to construction workers. The NRC annual occupational limit is 50 mSv [5,000 mrem], and the natural background radiation dose is 3.6 mSv [360 mrem]. The maximum occupational doses to SNF-handling workers is 9.1 mSv [910 mrem] annually, with the NRC annual occupational limit of 50 mSv [5,000 mrem]. The annual radiation dose to all workers within an 8-km [5-mi] radius is <math>6.68 \times 10^{-5}</math> person-mSv [<math>6.68 \times 10^{-3}</math> person-mrem]. Detailed analyses of the radiation doses from off-normal events and accidents at the proposed Idaho Spent Fuel Facility are in the safety analysis report<sup>b</sup> and will be evaluated as part of the NRC Safety Evaluation Report. Further, analyses were also made of the public and occupational health impacts of external events such as flooding, aircraft impact, volcanic hazards, seismic hazards, and extreme wind and wind-generated missiles. Design features and operational practices are expected to minimize the public and occupational health impacts of these events and accidents.</p>	<p>NO IMPACT. No impacts would occur because SNF would continue to be stored at existing facilities. There would be no construction or operational activities, and the land would continue to be used as a restricted access construction laydown area.</p>

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Table 2-1. Summary of Environmental Impacts for the Proposed Idaho Spent Fuel Facility and the No-Action Alternative (continued)		
Affected Environment	Impacts	
	Proposed Idaho Spent Fuel Facility	No-Action Alternative <sup>a</sup>
Waste Management	SMALL. Small quantities of gaseous, liquid, and solid low-level radioactive waste will be generated during the SNF receipt and repackaging operations planned for the first 3 years. Once fuel is repackaged and stored, no gaseous releases or liquid or solid radioactive wastes are anticipated on a regular basis. Less than 17,790 L [4,700 gal] of low-level liquid wastes will be generated annually from decontamination activities. The INEEL Radioactive Waste Management Complex has the capacity to handle the small quantities of wastes generated during the storage period for the repackaged SNF.	NO IMPACT. No impacts would occur because SNF would continue to be stored at existing facilities. There would be no construction or operational activities, and the land would continue to be used as a restricted access construction laydown area. No new wastes would be created or added to the existing waste stream.
<p>BLM = Bureau of Land Management            DOE = U.S. Department of Energy            EIS = environmental impact statement            FWENC = Foster Wheeler Environmental Corporation            HEPA = high efficiency particulate air            INEEL = Idaho National Engineering and Environmental Laboratory            INTEC = Idaho Nuclear Technology and Engineering Center            NRC = U.S. Nuclear Regulatory Commission            SNF = spent nuclear fuel            TRIGA = training, research, and isotope reactors built by General Atomics</p> <p><sup>a</sup> Environmental impacts of current and planned DOE programs are addressed in two existing NEPA documents [(DOE. DOE/EIS-0203-F, "Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement." Idaho Falls, Idaho: DOE, Idaho Operations Office. 1995); (DOE. DOE/EIS-0287-F, "Idaho High-Level Waste and Facilities Disposition Final Environmental Impact Statement." Idaho Falls, Idaho: DOE, Idaho Operations Office. 2002)].</p> <p><sup>b</sup> FWENC. "Safety Analysis Report, Idaho Spent Fuel Facility." NRC Docket No. 72-25. ISF-FW-RPT-0033. Morris Plains, New Jersey: FWENC. 2001.</p>		

1 Agreement among DOE, the State of Idaho, and the U.S. Navy to remove SNF from  
 2 Idaho by 2035.

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- 4 • Currently, most SNF to be received by the proposed Idaho Spent Fuel Facility is stored  
 5 at INTEC. Transfer distances from current storage locations to the proposed facility are  
 6 relatively short.
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- 8 • Although the current storage configuration has worked well, it does not prepare the SNF  
 9 for shipment from INEEL to a national HLW repository.

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11 The proposed Idaho Spent Fuel Facility will provide the ability to remove the SNF from existing  
 12 canisters, place it in specially designed storage containers, then seal and place the loaded  
 13 containers in interim storage. The new containers are designed to be compatible with  
 14 transportation systems and with the eventual permanent disposal systems. Hence, once the  
 15 SNF is placed in the canisters, it would not need to be repackaged for shipment to a national  
 16 HLW repository when one becomes available.

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18 **2.8 References**

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34 ———. "Environmental Statements Availability, etc; Programmatic Spent Nuclear Fuel  
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38 ———. DOE/EIS-0203-F, "Department of Energy Programmatic Spent Nuclear Fuel  
 39 Management and Idaho National Engineering Laboratory Environmental Restoration and Waste  
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 41 Idaho Operations Office. 1995b.

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 45 Docket No. 72-25, TAC No. L20768. FW-NRC-ISF-03-0048. Letter (March 7) from R.D. Izatt  
 46 to NRC. Richland, Washington: FWENC. 2003. [The preceding document is available for  
 47 public review through the NRC electronic reading room at  
 48 <http://www.nrc.gov/reading-rm/adams.html>.]  
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## Alternatives

- 1 ———. “Environmental Report, Idaho Spent Fuel Facility.” NRC Docket No. 72-25,  
2 ISF-FW-RPT-0032. Morris Plains, New Jersey: FWENC. 2001a.  
3
- 4 ———. “Safety Analysis Report, Idaho Spent Fuel Facility.” NRC Docket No. 72-25.  
5 ISF-FW-RPT-0033. Morris Plains, New Jersey: FWENC. 2001b.  
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- 7 ———. “License Application, Idaho Spent Fuel Facility.” NRC Docket No. 72-25.  
8 ISF-FW-RPT-0127. Morris Plains, New Jersey: FWENC. 2001c.  
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- 10 ———. “Emergency Plan, Idaho Spent Fuel Facility.” NRC Docket 72-25. ISF-FW-PLN-0021.  
11 Morris Plains, New Jersey: FWENC. 2001d.  
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- 13 NRC. NUREG-1626, “Final Environmental Impact Statement for the Construction and  
14 Operation of an Independent Spent Fuel Storage Installation to Store the Three-Mile Island  
15 Unit 2 Spent Fuel at the Idaho National Engineering and Environmental Laboratory.”  
16 Washington, DC: NRC. March 1998.