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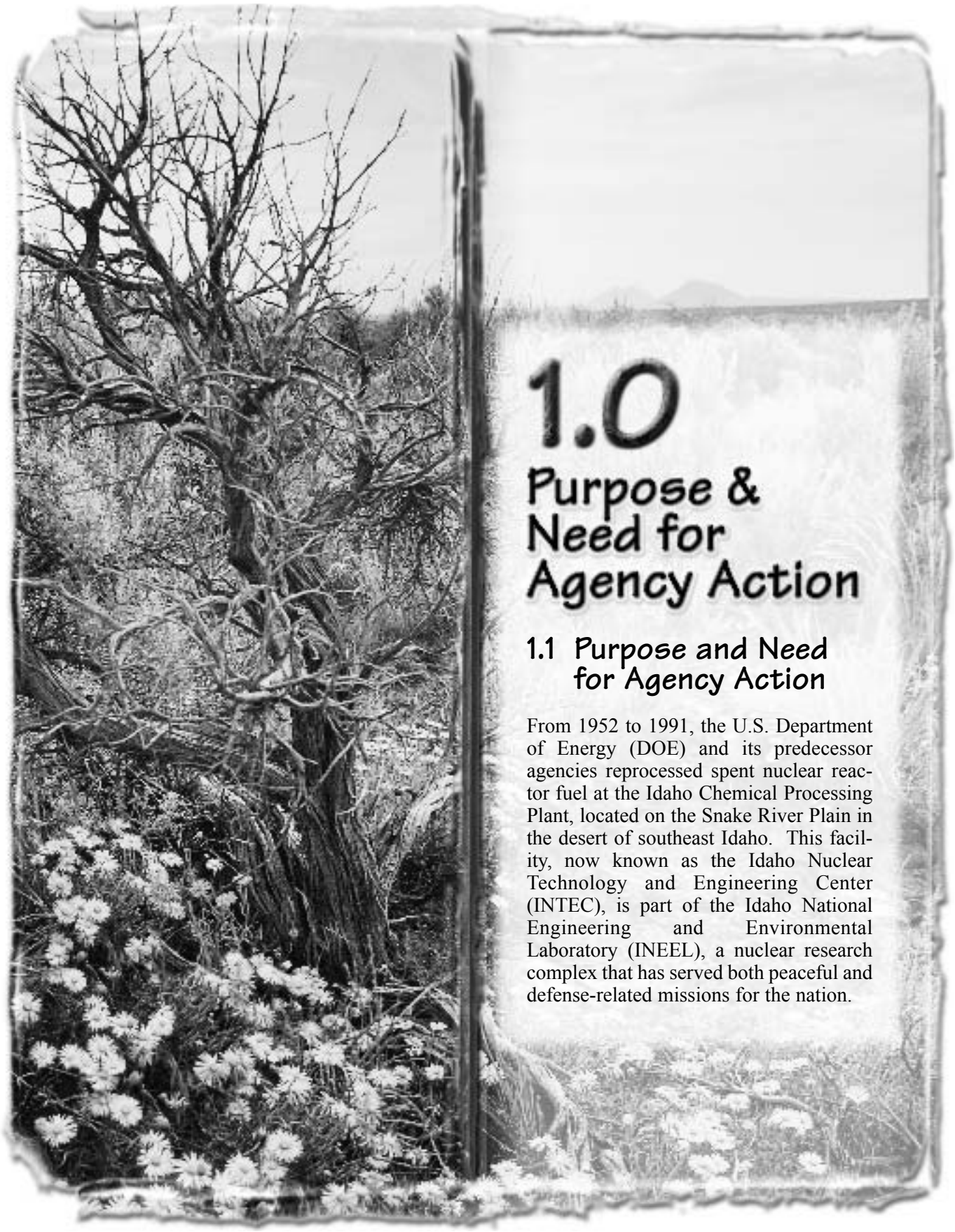
Purpose & Need for Agency Action



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From 1952 to 1991, the U.S. Department of Energy (DOE) and its predecessor agencies reprocessed spent nuclear reactor fuel at the Idaho Chemical Processing Plant, located on the Snake River Plain in the desert of southeast Idaho. This facility, now known as the Idaho Nuclear Technology and Engineering Center (INTEC), is part of the Idaho National Engineering and Environmental Laboratory (INEEL), a nuclear research complex that has served both peaceful and defense-related missions for the nation.

Processing operations at INTEC utilized solvent extraction systems to extract uranium-235 and other defense-related materials from spent nuclear reactor fuel and, in the process, generated high-level waste (HLW) as well as other wastes. The first extraction cycle of the reprocessing operation ***produced liquid mixed HLW***. Subsequent extraction cycles, follow-up decontamination activities, and ***mixed*** HLW treatment activities produced additional liquid waste, generally less radioactive than ***mixed*** HLW, ***that may be*** characterized as mixed transuranic waste ***(see text box on page 2-7)***. Since the decontamination solutions contained high levels of sodium, this liquid waste is referred to ***in this environmental impact statement (often referred to as the Idaho HLW & FD EIS or simply "this EIS")*** as mixed transuranic waste/sodium-bearing waste or mixed transuranic waste/SBW. At INTEC, all of these liquid wastes were stored in eleven 300,000-gallon ***below grade*** tanks. Over several years, ***first extraction cycle liquid mixed HLW and some of the liquid mixed transuranic waste/SBW were*** fed to treatment ***facilities*** and converted to a dry granular substance called ***mixed HLW*** calcine. ***In 1998, DOE completed calcining all remaining liquid mixed HLW.*** The calcine, which is stored in large, robust bin sets, is a more stable waste form, posing less environmental risk than storing liquid radioactive waste in underground tanks. However, the calcine ***does*** not meet current waste acceptance criteria for disposal in ***the*** geologic repository. At present, approximately ***4,400*** cubic meters of ***mixed*** HLW calcine is stored in INTEC bin sets, and ***approximately 1*** million gallons of ***mixed transuranic waste/SBW remain in the Tank Farm.***

History of High-Level Waste

In a 1969 staff paper published by the Atomic Energy Commission ("Siting of Commercial Fuel Reprocessing Plants and Related Waste Management Facilities"), high-level liquid wastes were described as "those, which by virtue of their radionuclide concentration, half-life, and biological significance, require perpetual isolation from the biosphere, even after solidification."

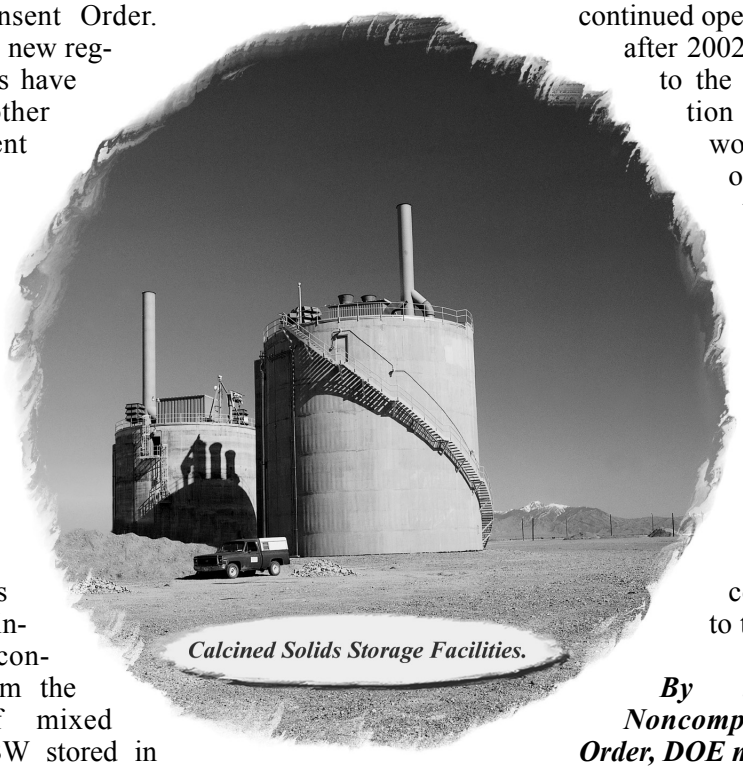
It was anticipated that the only liquid waste meeting these criteria would be the liquid generated during the first cycle of a process that extracted ***fissionable nuclear material*** *from dissolved irradiated nuclear reactor fuel. Liquid wastes from subsequent extraction cycles typically did not contain radionuclides at levels that warranted permanent isolation. However, these wastes could be considered HLW if concentrated to the point where radionuclide concentrations and half-lives would pose a significant long-term risk to the biosphere. The Nuclear Waste Policy Act of 1982, as amended, determined that a geological repository would be used for providing the necessary permanent isolation.*

DOE now has to decide how to treat and dispose of the mixed transuranic waste/SBW, how to place the mixed HLW calcine in a form suitable for disposal in the national geologic repository, and how to disposition HLW management facilities at INTEC including any new facilities required to treat and dispose of the waste. DOE has prepared this EIS to inform agency officials and the public of the environmental impacts of alternatives available for consideration in the decision making process, including the alternative of taking no action.

1.2 Timing and Regulatory Considerations Important and Relevant to Purpose and Need

Since the 300,000-gallon ***below grade*** storage tanks at INTEC were not built to current hazardous waste management standards, it is DOE's objective to empty them and initiate tank closure in compliance with applicable regulations. DOE intended to empty the tanks by calcining all of the liquid waste. This course of action was selected in ***the*** 1995 ***DOE Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement (SNF & INEL EIS)*** Record of Decision as the appropriate treatment (60 FR 28680; June 1, 1995). Further, commitments regarding when the liquid waste would be calcined were made to the State in the 1995 Idaho Settlement Agreement/Consent Order (USDC 1995) and subsequently included in the Site Treatment Plan Consent Order. ***However,*** since 1995, new regulatory considerations have necessitated another review of treatment options.

Some of these considerations include technical constraints, which have hindered DOE's efforts to sample offgas emissions from the New Waste Calcining Facility calciner, as well as logistical problems associated with obtaining representative constituent samples from the large volumes of mixed transuranic waste/SBW stored in the tanks. ***The technical constraints for offgas sampling of the New Waste Calcining Facility calciner were resolved. Prior to placing the calciner in standby in May 2000, DOE completed offgas emission sampling for hazardous waste regulated by the Resource Conservation and Recovery Act (RCRA), using methods agreed to by the U.S. Environmental Protection Agency (EPA). The State of Idaho was kept informed during this process and observed the sampling program. In addition, some of the logistical problems associated with obtaining representative samples from the below grade tanks were resolved. Subsequently, DOE has been able to obtain and characterize some representative samples of the mixed transuranic waste/SBW stored in the below grade tanks.*** This emission and waste characteristic data is needed to support a RCRA permit, which must ***be approved by*** the State of Idaho in order to continue ***operating*** the calciner. ***In accordance with the Notice of Noncompliance Consent Order, DOE has ceased calciner operations until such a permit is granted*** (Kelly 1999).



Calcined Solids Storage Facilities.

In addition to the RCRA permit, ***another regulatory consideration is that the*** EPA has new air quality standards for hazardous waste combustion units***, which*** must be met to allow continued operation of the calciner after 2002. Physical upgrades to the calciner and collection of additional data would be required in order to comply with these new standards. For these reasons, DOE needed to reconsider its decision to operate the calciner and consider the relative merits of other alternatives that would ***cease use of the tanks within the*** time commitments ***made*** to the State of Idaho.

By the Notice of Noncompliance Consent Order, DOE must cease use of the five pillar and panel vault tanks by June 30, 2003, and cease use of the remaining tanks by December 31, 2012. DOE is also committed to treating the calcine so that it can be put in a form that can be transported out of Idaho to

a disposal or storage facility by a target date of December 31, 2035 (USDC 1995). In ***the*** 1995 ***SNF & INEL EIS*** Record of Decision, DOE selected a treatment technology (radionuclide partitioning) to be tested for potential use. If testing proved successful, DOE would move forward and prepare a site-specific National Environmental Policy Act analysis, comparing the potential environmental impacts of a radionuclide partitioning facility to other available treatment alternatives. ***Some testing was accomplished at the INEEL and DOE continues to evaluate radionuclide partitioning technologies to determine their viability. In concert with those activities,*** DOE ***began preparation*** of this ***EIS to meet the*** requirement in the Settlement Agreement/Consent Order that directs DOE and the State of Idaho to start negotiations regarding the plan and schedule for treatment of the calcined waste by December 31, 1999. For both parties to participate in meaningful discussions on this subject, both need to understand the available alternatives and their potential impacts. Further, in order for DOE to act on the outcome of these negotiations, a Record of Decision must be issued based on this EIS.

As required under the National Environmental Policy Act, this EIS must analyze environmental impacts associated with related project actions. In this case, actions related to selecting a treatment technology for ***mixed*** HLW and mixed transuranic waste/SBW include storage and disposal alternatives associated with the various waste streams from these processes as well as disposition of ***associated HLW management*** facilities. This analysis is necessary so that an assessment of cumulative impacts associated with the various treatment, storage, and disposal options can be presented and put into perspective with other activities that may affect the environment. At INTEC, for example, a remedial investigation and feasibility study and consequent Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Record of Decision (DOE 1999) has resulted in the selection of remedial actions for areas of historical contamination. One of the criteria used to select a remediation alternative is the calculated risk to human health and the environment. However, these risk calculations do not factor in any additional risks posed by the treatment, storage, and disposal options that DOE needs to identify for ***mixed*** HLW and mixed transuranic waste/SBW.

In this EIS, DOE identifies potential risks to human health and the environment from the various ***mixed*** HLW, mixed transuranic waste/SBW, and newly generated liquid waste management options. Remedial actions selected under the Record of Decision for the Operable Unit 3-13 portion of Waste Area Group 3 and the ongoing CERCLA evaluations for the remainder of Waste Area Group 3 may affect waste processing and facility disposition options at INTEC. ***Therefore,*** this EIS evaluates the cumulative impacts of CERCLA actions as well as alternatives for the management of ***mixed*** HLW and mixed transuranic waste/SBW. ***(CERCLA evaluations are required to incorporate National Environmental Policy Act values under DOE policy.)***

In addition to the reasons discussed above, the following factors are relevant to the timing for this EIS. First, it is not too soon for DOE to begin an environmental analysis of ***alternative*** technologies that ***could be used for wastes requiring treatment to meet DOE commitments.*** The alternative treatment technologies evaluated in this EIS will require lead time for conceptual design and engineering. Adding these years to a schedule for construction and the operational lifetime of a selected technology leaves DOE little flexibility in meeting commitments set forth in the Settlement Agreement/Consent Order. Second, this EIS is being prepared at a time when there is considerable funding uncertainty. By evaluating innovative alternative scenarios and technologies, DOE is maximizing its scope of possibilities, and by doing so will be better prepared to deal with future resource constraints without compromising commitments to the State of Idaho.

The necessary lead time for facility development and funding of alternative technologies accelerates previous estimates of time when a DOE ***EIS*** Record of Decision would be needed to select a calcine treatment technology. When the Settlement Agreement was being negotiated in 1995, it was assumed that the calciner would continue operation through 2012, and issuing ***an EIS*** Record of Decision on a technology for treating the calcine could occur as late as December 31, 2009, without jeopardizing the

target date of December 31, 2035, for having all the waste treated and ready to leave Idaho. However, after the Settlement Agreement/Consent Order was signed, it was determined that there are alternative technologies that would not involve calcining waste prior to further treatment. Initial engineering analyses of such alternatives, with associated schedules taking into account the time required for design and funding acquisition, revealed that if DOE wanted to select one of these technologies, decisions would have to be made as early as the year ***2002***. Thus, the timing of this EIS will enable DOE to ***better*** meet the ***milestones contained in the*** Consent Order and the Settlement Agreement.

1.3 *Proposed Action*

Based on this EIS, DOE ***proposes to:***

- ***Select appropriate technologies and construct facilities necessary to prepare INTEC mixed transuranic waste/SBW for shipment to the Waste Isolation Pilot Plant***
- ***Prepare the mixed HLW calcine so that it will be suitable for disposal in a repository***
- ***Treat and dispose of associated radioactive wastes***
- ***Provide safe storage of HLW destined for a repository***
- ***Disposition INTEC HLW management facilities when their missions are completed***

1.4 Role of this EIS in the Decision-Making Process

This EIS describes the environmental impacts of the range of reasonable alternatives for meeting the purpose and need. In finalizing this EIS, DOE considered public comments received on the Draft EIS and other relevant factors and information received after the Draft EIS was published. DOE will consider the information in this EIS and other relevant information before making a decision on the proposed action.

If on the basis of this EIS, DOE proposes modifications to the Settlement Agreement/Consent Order, the information in this document and the cooperative process used to ensure its adequacy will benefit related discussions between the State of Idaho and DOE.

1.5 Organization of the EIS

The organization of this EIS is as follows. Chapter 2 provides background information on the INEEL and the waste management issues pertinent to this EIS. The alternative methods for achieving the purpose and need are described in Chapter 3, Alternatives. The affected environment for the proposed waste processing and facility disposition activities is described in Chapter 4. The environmental consequences of the alternatives are presented in Chapter 5. Chapter 6, Statutes, Regulations, Consultations, and Other Requirements, provides more details on related environmental statutes and regulations. Chapter 7 provides a glossary of terms. Chapter 8 identifies the contents of the appendices. Chapter 9 lists the references. Chapter 10 provides the list of preparers and the conflict of interest representation statements. Chapter 11 summarizes the comments received on the Draft EIS and provides responses to those summaries. Chapters 12 and 13 provide the distribution list and index, respectively. The appendices provide technical information, including analytical methods and detailed results and copies of the actual transcribed and written comments received on the Draft EIS.