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ADDENDUM
(FINAL ENVIRONMENTAL IMPACT STATEMENT)

Management of Spent Nuclear Fuel from the K Basins at the Hanford Site, Richland, Washington

January 1996

U.S. DEPARTMENT OF ENERGY
RICHLAND, WASHINGTON 99352

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January 1996

U.S. Department of Energy
Richland, Washington

COVER SHEET

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TITLE: Addendum (Final Environmental Impact Statement). Management of Spent Nuclear Fuel from the K Basins at the Hanford Site, Richland, Washington. [The Final Environmental Impact Statement (EIS) consists of the Draft EIS and this Addendum].

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ABSTRACT: The purpose of the Final EIS is to provide environmental information to assist DOE in the selection of an alternative for the management and storage (up to approximately 40 years) of spent nuclear fuel (SNF) currently located in the K Basins at the Hanford Site. Management and storage/disposal of sludge, debris, and water in the K Basins are also included in the Final EIS. Alternatives considered include 1) no action, 2) enhanced K Basin storage, 3) new wet storage, 4) drying/passivation (conditioning) with dry storage (the preferred alternative), 5) calcination with dry storage, 6) onsite processing, and 7) foreign processing.

CONTENTS

PREFACE

This Final EIS consists of two volumes: the first volume is the Draft EIS as previously issued and the second volume consists of this addendum, which contains copies of the comments on the Draft EIS, DOE's responses to the comments, and errata.

1.0 INTRODUCTION

Approximately 2,100 metric tons (2,300 tons) of spent nuclear fuel (SNF) is stored at the U.S Department of Energy's (DOE's) Hanford Site in southeast Washington in SNF storage basins at the K East (KE) and K West (KW) Reactors. This SNF is principally metallic uranium, but also includes about 5 metric tons (6 tons) of plutonium and about 1 metric ton (1.1 tons) of radioactive fission products. Most of this fuel is from the operation of the N Reactor. Some of the fuel is damaged and has corroded and become radioactive sludge. Fuel in the KE Basin is stored in open canisters; corrosion products (sludge) have fallen to the floor of the basin. Fuel in the KW Basin is stored in sealed canisters so any sludge is contained in the canisters. The KE Basin has leaked water and radionuclides to the soil beneath the basin, but neither basin is believed to be leaking now.

1.1 Programmatic Environmental Impact Statement

In April 1995, the DOE published a programmatic environmental impact statement (EIS) entitled, *Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement* (DOE 1995a). In its record of decision (ROD) published in the *Federal Register* on June 1, 1995 (60 FR 28680), DOE elected to implement the "regionalization by fuel type" alternative. Under this alternative, SNF located in the Hanford K Basins will remain at Hanford until a decision is made on ultimate disposition of the SNF.

1.2 K Basins Spent Nuclear Fuel Environmental Impact Statement

On March 28, 1995, DOE published a notice of intent (NOI) in the *Federal Register* (60 FR 15905) to prepare an EIS on management of spent nuclear fuel from the K Basins at the Hanford Site, Richland, Washington (K Basins SNF EIS). The K Basins SNF Draft EIS was published in October 1995 (DOE 1995b) and was announced in the *Federal Register* on November 9, 1995 (60 FR 56581). This EIS is tiered from the programmatic EIS and was prepared in accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA) as amended, the implementing regulations of the Council on Environmental Quality (CEQ) at 40 CFR 1500-1508, and the DOE's regulations at 10 CFR 1021.

DOE's proposed action in the K Basins SNF EIS is to take expeditious action to reduce risks to public health and safety and the environment by removing SNF from the K Basins and, subsequently, to take action to manage the SNF in a safe and environmentally sound manner for up to 40 years or until ultimate disposition decisions are made and implemented.

The purpose of and need for DOE's proposed action is to reduce risks to human health and the environment, specifically 1) to prevent the release of radioactive materials into the air or the soil surrounding the K Basins and the potential migration of radionuclides through the soil column to the nearby Columbia River, 2) to reduce occupational radiation exposure, and 3) to eliminate the risks to the public and to workers from the deterioration of SNF in the K Basins.

Alternatives considered in the K Basins SNF EIS include no action, enhanced K Basin storage, new wet storage, drying/passivation (conditioning) with dry storage, calcination with dry storage, onsite processing, and foreign processing. DOE selected as its preferred alternative drying/passivation (conditioning) with dry storage.

1.3 Results of Agency and Public Review

Copies of the draft EIS were made available to appropriate federal, state, and local officials and units of government, environmental organizations, libraries, and members of the public to provide interested parties the opportunity to review and comment on the draft EIS. During the 50-day comment period, a public hearing on the draft EIS was held in Pasco, Washington. One person presented comments on the draft EIS at the public hearing and 10 persons or organizations sent letters to DOE containing comments on the draft EIS. These comments were considered by the DOE in the preparation of the final EIS. Comments on the draft EIS did not require DOE to modify any alternative presented in the draft EIS, to evaluate any new alternatives, or to supplement, improve, or modify any analyses in the draft EIS. Therefore, the final EIS consists of two volumes: the first volume is the draft EIS as written, and the second volume consists of this addendum, which contains copies of the comments on the draft EIS, DOE's responses to the comments, and errata. Preparing an addendum is permitted by the CEQ regulations at 40 CFR 1503.4.

2.0 RESPONSES TO COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

Comments received by DOE on the Draft K Basins SNF EIS are presented in this chapter along with DOE's responses. DOE has prepared responses to substantive comments on the alternatives and impacts, but has not prepared responses to comments endorsing a particular alternative or comments that merely restate a known fact or information presented in the EIS. Persons and agencies who presented comments are listed in Section 2.1. The comments and their responses are presented in Section 2.2. Copies of the letters and the transcript are presented in Appendix A.

2.1 Persons and Agencies Presenting Comments

Letters received by DOE and the one set of comments received by DOE during the public hearing are listed in Table 2-1. Signed letters are numbered in the order in which they were received, followed by anonymous letters. The transcript is numbered according to the page number on which the comment begins.

Table 2-1. Comments Received on the Draft Environmental Impact Statement

Tracking Number	Commentor	Organization
Letters		
L01	Marceen Bloom	
L02	Curt Leslie	
L03	Craig Saxon	
L04	Mark Struiksma	
L05	Donna Powaukee	Nez Perce Tribe
L06	Dirk Dunning	Oregon Department of Energy
L07	Jay McConnaughey	Washington Department of Fish and Wildlife
L08	Marvin Vialle	Washington Department of Ecology
L09	Marilyn Meigs	BNFL, Inc.
L10	Concerned Citizen	
Transcript		
T	Gordon Rogers	

2.2 Comments and Responses

Letter comments (LXX- series) are numbered according to the number of the letter and the number of the comment within each letter. Transcript comments (T- series) are numbered according to the page number of the transcript.

L01-C01. Regarding storage of spent nuclear fuel, please analyze carefully. This is a sophisticated engineering project. My feeling is that the existing containers are very fragile and one mistake will cause a nonrecoverable loss of a river as well as potentially our lives and children. Please don't shortcut the operation. It must be safe and intelligent.

R. In addition to the accident analyses included in this EIS, DOE will prepare engineering design documentation to ensure the safety of all activities involved in handling the SNF. The existing containers (canisters) would be carefully handled, and any new containers would be built to appropriate engineering and structural standards. DOE's preferred alternative is to move the SNF away from the Columbia River.

L01-C02. Hopefully the trend toward nuclear storage wastes will be over.

R. Congress has directed DOE to provide for disposition of high-level radioactive waste, SNF, and transuranic wastes. Low-level radioactive wastes are disposed of at either commercial sites or at DOE sites.

L02-C01. One possibility not discussed as a possibility regarding the SNF in the K Basins is the 200 North Area. This was a five or so track siding area together with a series of cooling ponds built to the north and slightly east of 200 West and never used. If these are still serviceable, the SNF in question could be interim stored there, and over and above public uproar, commercial fuel could be stored awaiting its final disposition, at very little additional cost or risk.

R. Several storage facilities were built in various locations outside the 200 Area fences. Some of these facilities are now retired, and none is suitable for SNF storage.

L03-C01. Please be wise in your determination of how to proceed with the storage of this near immortal stuff we've created. Don't be swayed off the correct path.

R. Please see response to Comment L01-C01.

L04-C01. I read that all spent fuels in liquid forms would be converted into a nonradioactive placement by a process called in situ vitrification. Is this an option?

R. In situ vitrification refers to a process in which waste in sandy soil (in the ground) is converted along with the soil to a glass-like form by using heat from a large electric current to melt the soil and the waste. The process does not destroy or remove radioactivity: instead, it stabilizes and captures it within an essentially insoluble medium. You may be referring to vitrification of high-level radioactive waste, some of which is in liquid form. SNF is solid, not liquid, and while SNF could be vitrified by adding sand and melting the two together in a container, calcination (which is one of the alternatives considered in the draft EIS) would be a much more effective way of stabilizing SNF.

L05-C01. Page 1.5, par. 1.3. Some of the information that would ordinarily be presented in this EIS is incorporated by reference. For our convenience, we would prefer the reference information be submitted with the document rather than reference from another document.

R. In accordance with the Council on Environmental Quality regulations at 40 CFR 1502.20 and 40 CFR 1508.28, the K Basins SNF EIS is tiered from the DOE's Programmatic EIS on SNF. Information from the programmatic EIS is properly incorporated by reference in the site-specific EIS, particularly if the information is voluminous. This may require some readers to locate the referenced material in a DOE reading room, as described in the Notice of Availability. Incorporation by reference markedly reduces the size and cost of producing and distributing the EIS. For example, the referenced Final Programmatic EIS on SNF occupies about 12 inches on the shelf.

L05-C02. Page 3.12, par. 7. Sludge in the base of the K Basins consists partly of fine-grained materials that are easily suspendable when disturbed. After the first fuel rods are removed from the site, how will the remaining work be completed safely in cloudy water?

R. DOE has considerable experience in handling SNF in the K Basins and is very much aware of the water clarity problems associated with this work. Systems and procedures will be designed and implemented so that the water will be kept sufficiently clear to remove fuel, sludge, and debris.

L05-C03. Page 3.3, bullet 9. The EIS does not explain why contaminated water in the K Basins needs to be replaced with clean water following SNF removal. The Tribe is against storing anything in the K Basins, including water, that could potentially mobilize contaminants to the groundwater or Columbia River should a seismic event or accident occur. Please explain why replacing K Basin water with clean water is proposed.

R. Removal of SNF would lower the water level which, in addition to reducing the shielding above the remaining fuel, would expose the upper portions of the walls of each basin which are contaminated and which are an additional source of external radiation exposure. Clean water would be added to maintain the level of the water above the contamination in order to reduce the radiation exposure problem until such time as wall contamination can be removed.

L05-C04. Page 3.4, par. 2. A stated disadvantage of the preferred alternative is uncertainty regarding the chemical state and pyrophoric nature of the SNF. No explanation is given of how the pyrophoric state of the SNF will be monitored reducing the possibility of fire or reaction. Please explain how you propose to accomplish this monitoring.

R. Both during and after the conditioning process there is a low risk of a pyrophoric reaction of the SNF. During dry storage, the stabilized SNF would be sealed within stainless steel multicanister overpacks (MCOs) in an inert atmosphere. The hot conditioning, together with the MCO integrity and the inert atmosphere, would preclude a pyrophoric reaction. The storage building would have area and stack monitors to identify any radiation releases. See also the response to Comment T-27a.

L05-C05. Page 3.26, par. 4. An option considered is vacuum drying at one location. The preferred alternative endorses vacuum drying/conditioning at two locations. The EIS did not explain why two-stage drying was preferred. Unless a good engineering reason exists as to why two-stage conditioning/drying is necessary, the one-step option seems favorable to reduce expense. Please explain your chosen alternative.

R. Two-stage drying is considered to be prudent to allow early removal of SNF from the K Basins to provide the earliest minimization of SNF corrosion and to minimize the size and complexity of the processing equipment at the river.

L05-C06. Page 3.27, bullet 2. The EIS states that dry storage temperatures would not need to be as low as another option because significantly lower potential for continued corrosion exists. We suggest any corrosion in a sealed multicanister overpack (MCO) is too much, as it could cause pressurization and possible rupture of the MCO. Please clarify if continued corrosion is possible in sealed, dry-storage MCOs.

R. At this point, the EIS is referring to dry staging of SNF in the 200 Area, after removal of the SNF from the K Basins but before conditioning of the SNF is fully complete. Chemically bound water would still be present in the SNF. Corrosion can still occur, although at a much lower rate than if the SNF were immersed in water as in the wet storage alternative. The lower corrosion rate would allow a higher staging temperature.

L05-C07. Page 3.38, pars. 4 & 5. The EIS states that 2,800 tons of uranium trioxide and 5 tons of plutonium dioxide would be produced from processing K-Basin fuel in the onsite processing alternative. On page 1.1, the EIS states that only 2,315 tons of SNF are currently stored in the K Basins. Is the extra weight from the oxygen in the produced oxidized product? Is the extra weight fuel from another location or has a mistake been made in the calculation. Please explain.

R. The calculation correctly shows the extra weight due to oxygen (three atoms of oxygen for each atom of uranium). A small amount of SNF (0.3 metric ton) from the PUREX Plant has been transferred to the KW Basin and is included in this EIS.

L05-C08. Page 3.49, Table 3-2. Chlorine and alum are listed in Table 3-2 and usage quantities are given for each alternative. The reason for usage of these chemicals is not mentioned in the EIS text. Information on chemical usage would be valuable to us in assessing this and future Hanford related documents.

R. Chlorine and alum are used to treat river water for use as basin make-up water and for potable water. Chlorine is a biocide, and alum is used as a flocculent to improve particulate removal.

L05-C09. Page 3.52, par. 2. The EIS does not indicate an income range from uranium and plutonium oxide product sales in the processing alternatives. This information would be valuable to us.

R. At the present time, income from the sale of recovered uranium and plutonium is unknown and as a consequence only equivalency of uranium-235 and plutonium-239 in terms of energy content of coal is given as a broad indicator of its possible value (footnote (b) on page 3.37 of the Draft EIS).

L05-C10. Page 4.1, par. 2. The text indicates shrub steppe is inhabited by "large sagebrush." The correct common name is "big sagebrush."

R. The draft EIS is in error; "big sagebrush" is correct.

L05-C11. Page 4.14, Seismic Hazards. Long-term storage of SNF at the K Basins is not favorable partly because of the possibility of seismic hazards. A seismic event from a location such as the Coyote Rapids seismic swarm could crack the K Basins and cause leakage of water impacted with radioactive materials into the surface aquifer and possibly the Columbia River. The Tribe favors continuous seismic monitoring at the Hanford Site to mitigate this risk.

R. Seismic monitoring is carried on at the Hanford Site from a network of 25 instrumented sites. Impacts of the release of the entire inventory of K Basins water are discussed in Section 5.15.5 of the Draft EIS.

L05-C12. Page 5.12, par. 1. The EIS states that at the proposed Canister Storage Building (CSB) site direct or indirect impacts to traditional cultural properties are not anticipated. It is the opinion of some Tribal groups that the bulk of the Hanford Site should be listed as a cultural resource site. As a minimum, we request sagebrush steppe improvement at another location to mitigate lost CSB habitat should construction occur.

R. Construction and site disturbance have already occurred at the CSB site as part of a suspended project. As stated on page 5.39 of the Draft EIS, a habitat enhancement plan called the "Biological Resources Management Plan" is currently being developed by DOE for the Hanford Site which is intended to provide for the replacement of lost habitat and to involve interested groups and agencies.

L05-C13. Page 5.70, Table 5-49. Resource consumption for copper at a passivation facility is shown. What is the use of copper in a proposed passivation facility?

R. Copper would be used in wiring and in some heat exchangers.

L05-C14. Page 5.109, par. 4. Several chemicals including sulfuric acid, polychlorinated biphenyls (PCBs), sodium hydroxide, chlorine, and polyacrylamide are mentioned as present at the K Basins. To aid our understanding, we would like to know the use of these chemicals at the K Basins.

R. Sulfuric acid and sodium hydroxide are no longer used at the K Basins. Earlier, they were used as part of the river water treatment process, specifically in regeneration of demineralizers. The demineralizers are currently purchased from an off-site vendor who regenerates the demineralizers at their offsite facility. Polyacrylamide is used in small amounts in river water treatment as a filter aid. It allows filtering of small, suspended particles without plugging the filters. PCBs were used in electrical transformers. The transformers are being replaced with non-PCB containing transformers as part of electrical upgrade activities. See response to Comment L05-C08 for chlorine.

L05-C15. Page 5.119, par. 4. The EIS states that at the proposed SNF management facility, sagebrush steppe habitat would be lost until the facility is decommissioned and the site returned to its natural state. Does "returned to its natural state" mean the site will be revegetated? The Tribe requests, upon decommissioning, revegetation with natural vegetation.

R. The Draft EIS text at this point is referring to use of the reference site. The expression "returned to its natural state" is intended to mean revegetation with native vegetation.

L05-C16. Page 5.122, Table 5-74. In the last row of the table, lifecycle costs for various alternatives are given. What drives the variation in cost for the passivation/dry storage alternative?

R. The range of costs is a typographical error (see Figure 5-7 in the Draft EIS). The life-cycle cost for passivation/dry storage is $1.1 billion.

L05-C17. Page 5.123, par. 3. The EIS states that cultural surveys have been completed in the area of interest and that no cultural resources that might preclude construction were noted at either of the new proposed facility sites. The Tribe favors cultural resource surveys. Please reference the specific surveys completed for these proposed facilities. We request, when future cultural resource surveys are conducted, that we be contacted and offered the option of participating.

R. Cultural resource surveys of the areas of interest were conducted for the DOE Spent Nuclear Fuel Programmatic EIS and reports of findings of these surveys are referenced in the EIS. Affected tribes are notified of prospective cultural resource surveys by RL and are invited to participate (and have participated) in the surveys.

L05-C18. Page 5-124, pars. 2 & 3. The Tribe applauds the idea of habitat replacement mitigation at Hanford. We ask to be contacted and offered the option of input on proposed mitigation options when they occur.

R. Please see response to Comment L05-C12.

L05-C19. Page 6.6, pars. 3-6. The Tribe favors policies protecting Indian government, religion, culture and archeology. We interpret these policies to mean we should be contacted and allowed input into research and fieldwork to produce conclusions stated in this and other documents. The areas of protection of Native American cultural are quite broad in these policies. We support inclusion of Native American cultural-use plants protection policies as well.

R. Please see response to Comment L05-C17. As noted in Section 6.9 of the Draft EIS, DOE's American Indian Tribal Government Policy is in DOE Order 1230.2 which was issued April 8, 1992. The statement of policy in DOE 1230.2 was prepared to be consistent with relevant statutory authority and executive orders. The policy statement contains principles that are followed by DOE in its interactions with federally-recognized American Indian Tribes. In the policy statement, DOE makes several commitments including commitments to 1) consult with Tribal Governments to assure that Tribal rights and concerns are considered prior to DOE taking actions, making decisions or implementing programs that may affect tribes, and 2) consult with American Indians about the potential impacts of proposed DOE actions on areas of cultural or religious concern and avoid unnecessary interference with traditional religious practices.

L05-C20. Page A.1., par. 4. The Draft EIS states that an additional 0.3 metric tons of weapons grade uranium will be going to the K Basins from the Plutonium and Uranium Recovery through Extraction (PUREX) Plant. We realize that comments have already been received on this subject. We do not support continued shipment of uranium to the K Basins. Also, the document does not specify K East or K West as receiving shipments.

R. The PUREX SNF was received at the KW Basin during October 1995. This SNF, which represents about a 0.014% increase in the total K Basins inventory, was moved to consolidate fuel of this type in one location.

L05-C21. Page A.11, par. 2. The Draft EIS states that during a power outage, all K Basins fuel-handling activities will cease, since normal instrumentation will be lost. It is surprising that backup power does not supply the site. We consider it very important to condition, filter, monitor, and cool the water associated with fuel storage. Is emergency lighting available for employees to exit in an emergency? How can the site be safe when this condition exists?

R. Emergency backup power is not needed for the K Basins water treatment functions. The 1.2 million gallons of water in each pool is such a large volume that the water quality does not change quickly. A sixty-hour loss of power was evaluated as acceptable when storing SNF only 150 days after its removal from the N Reactor. The K Basin SNF has now aged over 8 years allowing an even longer acceptable power outage. Portable generators can be brought to the basins or normal power can be restored within the 60-hour period. Emergency lighting is automatically activated upon a power loss.

L05-C22. Page A.21, Fig. A-9. Locations within Figure A-9 are numbered; however, the numbers are not explained in a legend. For purposes of understanding, it is helpful to have a legend.

R. Figure A-9 is incorrectly labeled. The correct Figure A-9 is provided in the Errata section of this Addendum. These figures were intended to indicate the scope and complexity of the facilities, not to provide details of the design.

L05-C23. Page A.24, Fig. A-11. We would like to know the locations of positions 24, 26, and 27 not shown on the figure. Also, what is the purpose of a cold trap as shown at position 12? Information like this is important in evaluation of K-Basin alternatives.

R. Item 24 is below the elevation of the figure. It extends to the north from item 3 to item 2. Items 26 and 27 are on the second floor of the building above the elevation of the figure. Item 26 is above item 7. Item 27 is nominally above items 4 and 22. The cold trap is to condense gases released during SNF processing. This figure was incorrectly labeled in the Draft EIS; it actually depicts the proposed conditioning facility. The correct figures are provided in the Errata section of this Addendum.

L06-C01. Summary, page vi, last two sentences. The Environmental Impact Statement (EIS) should detail the mitigation measures which will be taken. The measures should be selected in consultation and coordination with the Hanford Natural Resources Trustee Council.

R. Potential mitigation measures are discussed in Section 5.20 of the Draft EIS. As stated in Section 5.9.2 (page 5.39) of the Draft EIS, a habitat enhancement plan called the "Biological Resources Management Plan" is currently being prepared by DOE for the Hanford Site which is intended to provide for the replacement of lost habitat and to involve interested groups and agencies.

L06-C02. Summary, page vii, second paragraph, last line states "Some actions at the K Basins will be coordinated with other cleanup activities in the 100-K Area." These should be identified in the EIS.

R. This statement refers to activities identified in the Surplus Production Reactors Decommissioning EIS and in work plans for remedial and corrective actions in the 100 Areas.

L06-C03. Summary, page vii, third paragraph. It should also be noted that the Dose Reconstruction for Hanford is not complete. Based on a population lifetime incremental cancer risk slope factor of 6×10^{-4} per rem of radiation exposure, the 100,000 person-rem of exposure corresponds to approximately 60 additional direct cancer fatalities as a direct result of Hanford operations.

R. This is mathematically correct. The number of 60 latent cancer fatalities from Hanford activities since 1943 may be compared, using the same factor, to the approximately 66 latent cancer fatalities each year in the same population from background dose (110,000 person-rem per year in a population of 380,000).

L06-C04. Summary, page vii, last sentence, and Section 5.9. Though the impacts of additional habitat destruction from selection of the undisturbed site may be small for this EIS, the cumulative impacts of habitat destruction from all of the EISs and actions planned, or considered at Hanford is very large. The habitat in this area of the Hanford Site is already of questionable size to support the sage grouse and other sensitive species. Any additional impacts should be avoided if at all possible. These impacts may also contribute to limiting the possible solution to other problems on the site.

R. Cumulative impacts are discussed in Section 5.16 of the Draft EIS.

L06-C05. Summary, page viii, second paragraph. The appropriate standard for comparison of the cancer risks posed by the activities proposed in this EIS is not the background natural radiation exposure. The natural background (page vii, third paragraph) based on the authors data presents an additional 1.8 x 10^{-4} lifetime fatal incremental cancer risk per year. Based on a fifty year exposure period, this corresponds to an additional direct lifetime fatal incremental cancer risk of 1.8 percent. The Superfund cleanup criteria for hazardous constituents is based on a lifetime fatal incremental cancer risk range from 1 x 10^{-6} on the low end to 1 x 10^{-4} on the high end. A 1.8 percent cancer risk corresponds to 180 times the upper end of the Superfund cleanup criteria. This is a more appropriate basis for risk comparison.

R. DOE believes that comparison with natural background is appropriate to put the cancer risk posed by the activities in perspective. Comparison with any other number is also appropriate as long as its relation to the actual number of cancer deaths from all causes and to the number of cancer deaths from background radiation is understood. DOE is uncertain as to how the 1.8 percent figure was obtained.

L06-C06. Summary, page viii, last paragraph. Any additional wastes added to the double shell tanks compete directly for available space with wastes from the single shell tanks. The SSTs are in continuous non-compliance with state and federal law. Reprocessing of the waste fuel would complicate resolution of the tank problems. Additionally, it would violate federal policy prohibiting reprocessing. This has potentially severe impacts on international agreements on disarmament and non proliferation.

R. As pointed out in Section 3.2.2 of the Draft EIS, the options for sludge management are to transfer the sludge to the double-shell tanks or solid waste disposal facilities at Hanford or to continue to manage the sludge as SNF. Selection of the alternative will depend upon the results of characterization studies. At the present time, there is excess space in the DSTs, which has been allocated for the sludge, contingent on meeting the acceptance criteria. Reprocessing of the SNF is a reasonable alternative and its inclusion is consistent with NEPA regulations.

L06-C07. Summary, page ix. As we previously noted in comments on the proposed cleanout of the PUREX facility nitric acid, use and destruction of nitric acid does not necessitate the release of large quantities of nitrogen oxides to the atmosphere. The semiconductor industry is now converting many of its wet chemical nitric acid oxidation processes to include an additional oxidant (hydrogen peroxide) to inhibit the formation of nitrogen oxides during silicon and metal dissolution. The U.S Department of Energy (USDOE) used a sugar denitration process at the PUREX and similar facilities to destroy nitric acid. This generated immense quantities of nitrogen oxides as waste off gas. USDOE previously demonstrated that nitric acid can be safely and effectively destroyed without generating significant quantities of nitrogen oxides by mixing it under controlled conditions with formic acid.

R. For this EIS, the impacts of the processing alternative were determined from historical data together with previously evaluated improvements, such as mechanical SNF decladding. This is a conservative approach. It is not DOE's preferred alternative to build or operate an onsite processing facility but, if that alternative were chosen, its actual design would utilize all appropriate technological improvements, including those that inhibit nitrogen oxide formation from any nitric acid used.

L06-C08. Introduction, page 1.1, first paragraph, last line. This may mislead the reader as to the extent of the fuel corrosion. Though fuel is only stored in open canisters in the K-East Basin, and hence has only released fuel and fission products into the water in significant quantities in this Basin, there is no reason to expect the fuel in K West Basin to be in much better shape. A large percentage of the fuel in both Basins is highly damaged and corroding. Also, due to the exclusion of additional oxygen in the containers in K-West, there is a strong possibility that a great deal more uranium hydride has formed in the fuel stored there.

R. DOE agrees that in the absence of visual confirmation, there is no reason to expect the SNF in the KW Basin to be in any better condition than that in the KE Basin. SNF handling processes under the preferred alternative (and all other alternatives) will be engineered on the assumption that uranium hydride is present. See also responses to Comment T-27a and Comment L05-C04.

L06-C09. Introduction, page 1.1, second paragraph, third line. This sentence is misleading. Though there is an asphaltic liner under both basins, the liner does not extend under the entire bottom of either basin. The liner does not extend under the construction seam between the basins and the K-105 reactor buildings. This construction joint is a weak point in the basins. The design allowed a several hundred gallon per day leakage from this joint into the soil and deemed this level of leakage acceptable.

R. DOE acknowledges that, as stated in Appendix A, page A.7 of the Draft EIS, the asphaltic membrane does not extend under the construction joint.

L06-C10. Description of Alternatives, page 3.1, no action alternative, last paragraph (see also Section 3.2.1). Though the design life of the basin is a great concern for many reasons, seismic risks, followed by drainage of the pool and possible fire, pose a much larger risk and are an even larger reason to move the fuel. The risk of large earthquakes at Hanford is small, but not zero. In a sizeable earthquake, the basins and the reactor buildings can be expected to behave as independent structures. This may result in the opening of the construction seam and drainage of the water in the basins. USDOE recently upgraded the basins to reduce this risk by adding steel doors to the basin. This reduced but did not eliminate the seismic risks. The basin design does not anticipate the potential of earthquakes as large as may occur on the site. British Nuclear Fuels reported to USDOE that there is a sizeable risk that fuels of the type stored in the basins may spontaneously ignite after exposure to air (see page 1.8, last paragraph, sixth sentence). This presents a huge and unacceptable risk to the citizens of the Northwest and is the major reason for proceeding with stabilization and removal of the fuel from the basins. The EIS should clearly show the potential magnitude of such an event. This information should also be forwarded to all other USDOE facilities storing similar materials. See the USDOE Spent Fuel Working Group Report, Volume 1, November 1993.

R. Seismic risks are discussed in Section 5.15 of the Draft EIS including loss of all of the water in the K Basins through the ground to the river. A fire in a multicanister overpack (MCO) is also discussed in Section 5.15.

Ignition of the entire inventory in either basin is not viewed by DOE as a likely consequence of an earthquake, since it would require a sequence of events which collectively have a low probability. However, the impacts of that accident could be estimated by extrapolating the results calculated for a fire in a single MCO as described in Section 5.15.

L06-C11. Description of Alternatives, page 3.2, enhanced K Basins storage alternative (see also Section 3.2.2). This has all of the disadvantages of the no action alternative and should be similarly modified in regard to the seismic disaster risk. Also, the basins provide no means for controlling radionuclide emissions to the air. This should be noted for both this and the no action alternatives.

R. There are no HEPA filters on the stacks in the K Basins. With respect to seismic risk, see response to Comment L06-C10.

L06-C12. Description of Alternatives, page 3.2, new wet storage alternative, last paragraph (see also Section 3.2.3). Contrary to this paragraph, the EIS provides no reason to believe that new wet storage would reduce the continuing deterioration of the fuel. It may confine most of it to canisters, but these will have to be vented to allow for release of hydrogen and noble gases from the on-going corrosion of the fuel. Also, movement of the fuel will likely cause a large one-time degradation of the fuel due to jostling, which may break up some fuel and corrosion products, thereby exposing additional fuel to corrosion.

R. The cited statement in the Draft EIS is incorrect. New wet storage will not reduce deterioration of the SNF.

L06-C13. Description of Alternatives, page 3.3, drying/passivation (conditioning) with dry storage alternative, seventh bullet (see also section 3.2.4). The Hanford tanks already contain some of the most complex and difficult wastes imaginable. The addition of any new wastes to these tanks will only compound the problems in removing and handling these wastes. It is unacceptable to consider adding a water reactive, pyrophoric, hydrogen generating solid to this witch's brew. Recent testing has demonstrated the presence of polychlorinated biphenyls (PCBs) in the sludge. This is not surprising. PCBs were believed to be safe and were used indiscriminately by industry in the past. The Hanford radioactive wastes were often viewed as so terrible that additional hazards could not significantly increase the problem. Neither the tank farms or the water disposal facilities are permitted to accept PCBs. If the sludge is to be consolidated with other wastes, it is most similar in its characteristics to the fuel in the basins, and should be dried, stabilized, packaged, and stored with the corroded spent fuel for final disposition.

R. Please see response to Comment L06-C06. Disposal of sludge in the Hanford tanks is proposed as the best solution considering cost effectiveness and material compatibility. Unacceptable constituents of the sludge, as determined by characterization, will be removed and managed as necessary.

L06-C14. Description of Alternatives, page 3.3, drying/passivation (conditioning) with dry storage alternative, eighth bullet (see also Section 3.2.4). The debris in the basin is likely sufficiently contaminated with plutonium and other actinides that it may be properly classified as transuranic (TRU) waste. Because it is the result of a slow water reprocessing of the fuel and includes pieces of fuel, it may also be high level waste (see Title 42 U.S. Code, Chapter 108, Section 10101(12)). Also, if it is contaminated with PCBs, additional disposal restrictions (mixed waste) may apply.

R. Debris is defined in Section 3.2.2 of the Draft EIS as empty canisters or other equipment and the storage racks used to hold SNF canisters. Debris is not SNF, is not TRU waste and is not high-level waste. "Mixed waste" is a term used to define wastes that are both radioactive (regulated under the Atomic Energy Act) and hazardous (regulated under the Resource Conservation and Recovery Act). PCBs are regulated under the Toxic Substances Control Act, and will be evaluated and appropriately managed under applicable regulations. Corrosion is a natural consequence of storing the SNF in water and is not considered by DOE to be processing as defined by the cited code chapter.

L06-C15. Description of Alternatives, drying/passivation (conditioning) with dry storage alternative, page 3.4, first paragraph, last sentence (see also Section 3.2.4). The drying and passivation of the fuel may reduce the hydrides in the fuel, but it is highly unlikely that it will eliminate them. Initial analytical data on the fuel reports a sizeable quantity of hydrogen in the fuel.

R. While it is possible that the conditioning process can eliminate uranium hydride from the SNF, DOE agrees that in any practical application, some hydride will remain. See also responses to Comment T27a and Comment L05-C04.

L06-C16. Description of Alternatives, page 3.4, calcination with dry storage (see also Section 3.2.5). Calcination will release a sizeable fraction of the fission products in the fuel. The EIS should state this, estimate the amount of material expected to be released, explain how these will be treated, captured, or contained, and what their ultimate disposition will be.

R. See Section 5.7.1 of the Draft EIS where source terms, including releases as suggested, are taken into account.

L06-C17. Description of Alternatives, page 3.4, onsite processing, second paragraph (see also Section 3.2.6). As a nation, we are awash in plutonium and uranium. There is no economic value to be gained from separating this material. Contrary to the statement in the last line, the wastes produced will not be in a form suitable for storage in a geologic repository. The processing of the tank wastes into a more stable form is not guaranteed. Any additional wastes generated and sent to the tank farms will add to the burden already present in the tank farms and further jeopardize the removal of the waste from the non-compliant single shell tanks. Further, page 3.4 lists two disadvantages and omits the radioactive emissions which would occur from such a facility. It also omits that no facility exists at Hanford which could perform this operation. This would necessitate the construction of a new reprocessing facility with a very limited mission at exorbitant cost. This in turn raises issues over nonproliferation and dismantlement. It would violate U.S. policy not to reprocess fuel.

R. While there may be no economic value in separating uranium and plutonium from SNF at the present time, both substances continue to have an energy value. While it is true that tank wastes in their present form are unsuitable for storage in a repository, vitrified tank wastes should be suitable. Radioactive emissions are discussed in Section 5.7.1 of the Draft EIS. The text in

Section 3.1 of the Draft EIS states that a disadvantage of onsite processing is the "need to construct and operate a relatively expensive separations facility." Foreign policy issues are beyond the scope of this EIS. See also the response to Comment L06-C06.

L06-C18. Description of Alternatives, page 3.5, foreign processing (see also Sections 3.2.7 and 6.1). This option also omits the discussion of impacts on non proliferation treaties. The transportation of this highly degraded pyrophoric fuel would present very large and undefinable risks. The potential disaster hazard from an accident involving this material is unacceptably large. Whatever is done to stabilize the fuel must occur at Hanford.

R. Foreign policy issues are beyond the scope of this EIS. Transportation accidents are discussed in Section 5.11.4 of the Draft EIS.

L06-C19. Description of Alternatives, page 3.5, discussion after alternatives, first paragraph. As noted previously, shipment of the sludges to tank farms unacceptably impacts future treatment and handling of the tank wastes. The presence of PCBs makes the sludges unacceptable for shipment to tank farms. Throughout Hanford's history, there has been a tendency for the technical staffs to push off the resolution of difficult waste problems to some undefined future using unproven technology by disposing of wastes to the tank farms. Often this was predicated on a comparison of the costs. This EIS proposes the sludge be disposed to tank farms in the same manner and for similar reasons. Until the wastes are being removed from the tanks and the disposition process (presumably vitrification) is in full operation, no new types of wastes should be allowed in the tank farms. Even then, prior to their disposal to the tank farms, a representative waste stream should be fed to the disposition process (melter) to ensure that it is capable of handling these wastes. The risks from the tank wastes are dominated by cesium-137 and strontium-90 and their daughters in the near term. In the long term, other isotopes and pathways are likely to dominate. Technetium-99, iodine-129, plutonium (all isotopes), uranium (all isotopes) and neptunium-237 may be most dominant via various pathways and at different times. Addition to the burden in the tanks of any of these isotopes will directly increase the risk resulting from the tank wastes over the long term. Additionally, complex wastes which include abrasive solids are especially difficult to handle. These tend to destroy pumps and cause excessive wear, plugging and premature failure of piping and handling systems. Adding more of these materials will only increase this problem. This discussion also applies to all other options which envision disposal of the sludge to the tank farms.

R. Please see response to Comment L06-C06 and Comment L06-C14.

L06-C20. Details of Alternatives, No Action Alternative, page 3.7, fourth bullet. Minimizing the loading of the resin could conceptually be accomplished in at least three ways. First, remove the resins from service as they near a control limit. Second, change the resins to formulations which will not significantly remove TRU from the water. Or, third, add treatment system components ahead of the resins which are designed to selectively remove TRU. Reduction of the loading of TRU and other radioactive materials on the resins should only occur to mitigate or resolve problems caused by this combination, such as radiolytic decomposition of the resins. It should not be done to meet an arbitrary definition of contaminant level, such as TRU waste. The hazards posed by these materials remain the same. The first alternative does nothing to reduce the problem. It only increases the waste volume. If it is done to avoid the TRU waste classification, pursuing this alternative would only lead to additional burdens of transuranic materials being disposed of to the ground at the Hanford Site. This will increase the total burden of such materials and act as a cumulative impact on the radioactive waste plumes and future risks. This alternative should NOT be pursued. The second alternative may reduce the TRU loading on the resin, but will do so at the expense of increasing the TRU levels in the basin water. The third alternative necessitates additional systems. This adds to the complexity of the system and its maintenance. It has the advantage of separating the TRU materials from the rest of the waste and minimizing the volume of this waste stream. Whatever decision is reached, the wastes generated will contribute to risk at some location. This represents an additional source term for those risk calculations and is a part of the cumulative impacts caused by the actions undertaken as a result of this action and USDOE's activities.

R. The discussion appears complete within the comment as presented. DOE notes, however, that the second option is not viable. Leaving TRU in the basin water will result in increased air emissions, as evident by the higher air emissions at the KE Basin compared to the KW Basin (see Table 5-5 of the Draft EIS). The third alternative, upgrading the treatment system to remove TRU from the water ahead of the ion exchangers, is not consistent with the no action alternative.

L06-C21. Details of Alternatives, Section 3.2.2, Enhanced K Basins Storage Alternative, page 3.12, third paragraph. The sludge is a waste from the slow water dissolution reprocessing of the fuel. The spent fuel sludge in the KE Basin in addition to potentially being TRU waste is best described as high level waste and mixed waste. USDOE did not intend to cause this slow water reprocessing, but that does not change the character of the waste. A third option exists and should be selected for the sludge drying and passivation followed by canister storage along with the fuel awaiting ultimate disposal. Also, the EIS does not adequately analyze the potential chemical impacts on the tank wastes, impacts on the disposition of the tank wastes, or the impact on the long-term risks from the tank waste residuals. This discussion also applies to all other options that envision disposal of the sludge to the Hanford tank farms. Similarly, land disposal of the sludge presents similar cumulative risks which must be addressed if land disposal is proposed for the sludge. NRC licensure may be required in either case.

R. Please see responses to Comments L06-C06 and L06-C14. Management of tank wastes and associated risks will be discussed in the DOE's Tank Waste Remediation System EIS which is in preparation. Land disposal and an evaluation of the associated risks would be carried out only if characterization of the sludge showed that the sludge did not have to be managed as another type of waste. NRC licensing is not required for either tank storage or land disposal of DOE's radioactive wastes at the Hanford Site.

L06-C22. Details of Alternatives, Section 3.2.2, Enhanced K Basins Storage Alternative, Water Disposition, page 3.14. In 1993, as a result of a report that the plutonium in the sand filter backwash pit had exceeded an operational safety limit, we asked a large number of questions. Many of these were never answered. A series of these questions had to do with concerns over criticality safety in the geometry of the piping and treatment systems. We forwarded our concerns to the Defense Nuclear Safety Board, who in turn forwarded some of them to the Environmental Safety and Health staff at USDOE. This contributed to the analysis of the condition of spent fuels in the USDOE complex as reported in the Spent Fuel Working Group Report. Volume 1 details the condition of the fuel in many storage basins around the USDOE complex. It is apparent from the pictures of some of these fuels that a differential chemical/physical reaction may be occurring which may result in segregation of the uranium, plutonium and structural components. We were concerned in early 1993 that this may be the case. Our concern was heightened when the sand filter back wash pit was mixed and resampling then showed a lower plutonium content. If this indeed happened, this would tend to confirm that physical/ chemical separation of the plutonium has occurred to some degree. If the plutonium is separating from the uranium, adequate criticality controls may not be in place.

R. The original analysis indicated that the U/Pu ratio was lower than anticipated for the fuel composition, as noted in the comment. That analysis formed the basis for an Unreviewed Safety Question (USQ) related to the potential for a criticality event in the sand filter backwash pit. As part of the resolution of the USQ (see WHC 1994), a more thorough analysis identified that the U/Pu ratio is consistent with the anticipated fuel composition within the basin. No segregation of uranium and plutonium is believed to have occurred. Adequate criticality controls continue (and will continue) to be implemented.

L06-C23. Details of Alternatives, Section 3.2.3, New Wet Storage, page 3.15-17. This section omits any discussion of the treatment of air emissions which would have to occur for such a facility. The fuel must be expected to continue to slowly reprocess itself in the water until all available damaged fuel has fully degraded. During this time, the fission product and actinide inventory of the fuel will be released into the containers or basin. Some portion of this may be released to the air during normal operations, and significant releases may occur in an accident.

R. Please see Sections 5.7 and 5.15.5 of the Draft EIS.

L06-C24. Details of Alternatives, Section 3.2.4, Drying/Passivation (Conditioning) with Dry Vault Storage Alternative, page 3.21, fourth bullet. This alternative should also detail exhaust/ventilation treatment and control during the drying operation. At 50 degrees C, some of the more volatile fission products may be driven off the fuel and into the exhaust gas stream. Some of these already present a radiological control problem in the basin structure.

R. Please see Section 6.1 of the Draft EIS. Requirements will be met for control of radioactive emissions under the Clean Air Act National Emission Standards for Hazardous Air Pollutants regulations and under the Washington Department of Health's Radiation Protection - Air Emissions regulations.

L06-C25. Details of Alternatives, Section 3.2.4, Drying/Passivation (Conditioning) with Dry Vault Storage Alternative, page 3.21, fifth bullet. The EIS should also detail the potential environmental/ecological impacts of a venting/release from the MCOs in transport or in storage. If the canisters are stored in an inert gas atmosphere, venting may allow atmospheric oxygen to enter the container. Based on British Nuclear Fuels experience, this may lead to a fire and constitute a significant accident hazard - both to people and the environment.

R. Please see Section 5.15.5 of the Draft EIS.

L06-C26. Details of Alternatives, Section 3.2.4, Drying/Passivation (Conditioning) with Dry Vault Storage Alternative, page 3.21-31. This option does not discuss the necessary airborne radioactive contaminant controls from this facility. The controlled oxidation of the fuel will release many of the fission products. At 500 degrees C, a large portion of these may volatilize into the gas exhaust.

R. Please see Section 5.7 and the response to Comment L06-C24.

L06-C27. Table 3-2. The risks stated for the enhanced K-Basin storage and no action alternatives do not include the potential risks of an earthquake, followed by basin drain down and fuel ignition. Arbitrarily limiting the risk evaluation to not include this analysis is unacceptable. Despite the small probability of this event, the magnitude of the consequences necessitate its inclusion.

R. Please see response to Comment L06-C10.

L06-C28. Table 3-2. The stated risks for foreign processing from a transport accident appear to greatly understate the potential risk.

R. DOE believes that the assessment of potential risks associated with transport for foreign processing, as given in Table 3-2 and discussed in Appendix B of the Draft EIS, is reasonable.

L06-C29. Table 3-2. The table lists the basin sludges as low level wastes. These wastes are probably high level wastes by definition, and mixed wastes by characteristic (PCBs), as well as possibly being TRU waste.

R. Table 3-2 in the Draft EIS in Footnote g) shows sludge placed in a 200 Area tank farm as TRU wastes. See response to Comment L06-C19.

L06-C30. Section 4.6.3, Seismic Hazards, page 4.14, last sentence. The Uniform Building Code classifies the seismicity of eastern Washington as Zone 2B. Also, it should be noted that the 1991 Uniform Building Code (UBC) specifies an Importance Factor of 1.5 be used for this application (1991 UBC 2336(b) footnote 2) rather than the 1.25 specified for hazardous occupancies (1991 UBC Table 23-L). The provisions of the Uniform Fire Code (UFC) also apply. Article 80 of the fire code provides specific limitations and controls requirements for radioactive materials.

R. Uniform Building Code Zone 2B is correct.

L06-C31. Section 4.6.3, Seismic Hazards, page 4.16, first full sentence states "The most recent probabilistic seismic hazard analysis calculated an annual probability or recurrence of 5×10^{-4} for exceeding the design basis earthquake." This corresponds to a risk over 5 years for the no action alternative of 2.5×10^{-3} and over the 40 years of the enhanced storage alternative of $2 \times Lo^{-2}$. A <u>two percent</u> risk is a significant risk. Even a one quarter percent risk is significant. Both support requiring analysis and reporting of the potential consequences of a beyond design basis earthquake scenario at the basins.

R. Please see response to Comment L06-C10.

L06-C32. Section 4.8.1, Surface Water, page 4.24, second sentence states "A catastrophic flood caused by 50% failure of Grand Coulee Dam would cause a flood evaluation [sic] exceeding the height of the K Basins (DOE 1989, Appendix B)." This alone should disqualify the enhanced K Basins storage alternative from consideration and support the early removal of all fuel and wastes from the basins and the surrounding areas.

R. Enhanced K Basins storage is not DOE's preferred alternative.

L06-C33. Section 5.11, Transportation, page 5.45-62. (See also Section 6.1). The computer codes selected do not take into account the specific route transport risks. This is important for the rail and road routes through Oregon. The rail route includes transport through a constricted canyon with limited access for emergency responders, directly adjacent to the river on Umatilla tribal lands. The codes do not adequately address the potential impacts to the river or to tribal lands and rights. The road route down Interstate I-84 includes dangerous sections over Cabbage Hill and through Ladd Canyon. Both areas are subject to severe microclimates and road conditions. The computer codes do not adequately address accident probabilities for these areas. They do not ensure adequate preparedness and planning to avoid shipping in inclement weather. They also are not predicated on shipment of highly damaged fragile and corroding pyrophoric spent nuclear fuel with significant quantities of loose radioactive materials and uranium hydrides, hence can not be assured to adequately evaluate the potential releases of radioactive materials in an accident. This analysis need not be performed unless the foreign processing alternative is considered for selection.

R. State-specific data were used for the analyses in Appendix B of the Draft EIS (summarized in Section 5.11 of the Draft EIS). Prior to making any shipments, route-specific analyses would be performed and any transportation constraints would be identified.

L06-C34. Section 5.11, Transportation, page 5.46-62. (See also Section 6.1). For the reasons noted above, the codes do not adequately examine the potential consequences from a transport accident through the Columbia River Gorge, over the Cascade passes or in a major metropolitan area of either Oregon or Washington. They also do not adequately address the potential risks and consequences of an accident at the dockyards or on board ship either at the docks or in transit to sea, or at sea. This analysis need not be performed unless the foreign processing alternative is considered for selection. Additionally, based on the public comment on the recent EISs for shipment of foreign research reactor spent fuel, public opposition to such a shipping campaign must be expected to be extremely high in both Oregon and Washington.

R. Please see response to Comment L06-C33. Port accidents and accidents at sea are discussed in Section B.4.2 of the Draft EIS.

L06-C35. Section 5.14, Waste Management, Section 6.14.1, No Action Alternative, page 5.74-75. The impacts must be expected to be greater each year than at present. The fuel is continuing to corrode at an increasing rate. This will increase the quantities of waste and levels of contamination each year. Due to a basin leak in 1993, the basin water temperature was raised to attempt to cause basin components and waste to swell, thereby sealing the leak. This appears to have been effective. However, historic K-Basins documents note that the rate of corrosion and release of fission products and actinides to the pool water doubles for each ten degrees C rise in the basin water temperature. This is in accord with expected chemistry principles. The elevation of the basin water temperature will also increase the amounts of waste generated over historic trends.

R. Current waste generation rates were used as the basis for impact assessments because identifying future waste quantities is speculative. Sludge generation will generally increase over time as the SNF continues to corrode. This reinforces DOE's preferred alternative which is to remove and condition the SNF to preclude continued corrosion and deterioration.

L06-C36. Section 5.15, page 5.83-112. This section does not include an analysis of the impacts of routine and accident releases of radioactive materials on the environmental receptors. This may be important particularly for the species listed or under consideration for listing as rare, threatened or endangered under state or federal law.

R. Data on impacts on environmental receptors of routine releases of radioactive materials from the Hanford Site are available in the annual Hanford monitoring reports which are available in the libraries to which this

EIS was sent (see Chapter 9.0, Distribution List). There are few data upon which to model impacts of accidental releases of radionuclides on species other than humans.

L06-C37. Section 5.16, Cumulative Impacts Including Past and Reasonably Foreseeable Actions, page 5.113-115. This section does not identify the potential cumulative impacts to health and the environment as a result of accidental releases. Section 5.15 identifies several potential accident scenarios and their probabilities. Many of these have high risks of occurrence.

Cask Drop	1-14%
Spray Leak	10-100%
Liquid Release	1% per year
Fuel Removal	0.8-12%
MCO Overpressurization	0.04-4%
Crane Drop	0.8-1.4%

The risks from these and the chance of their occurrence are sufficiently large that the EIS should estimate the potential cumulative impacts that these may cause on health and environment.

R. Cumulative impacts of past routine and nonroutine releases of radionuclides at Hanford are included in Section 5.16.5 of the Draft EIS. Typically, cumulative impacts of past, present, and reasonably foreseeable actions are the sums of impacts expected to occur within various environmental categories, such as public health and land use, including impacts from other nearby facilities, but do not include impacts from accidents. Because the preparation of EISs occurs early in the planning process, details of final design and facility operations are not available for the development of a complete probabilistic risk assessment. As a consequence, it is common practice to postulate a suite of accidents having a reasonable likelihood of occurring whose consequences would likely bound what might happen if the action were to be carried out and if the accident were to take place. From this suite of accidents, a bounding accident is selected for each of the alternatives to provide a comparison of accident risks among the alternatives. Such a comparison is provided in Table 3-2 of the Draft EIS under the heading of point risk estimate. Also, see response to Comment L06-C36.

L06-C38. Section 5.16.5, Occupational and Public Health, page 5.117-118. The lifetime cancer risk from background and natural radiation is high. It is inappropriate to measure the impacts on occupational and public health by comparison against this large background. Additionally, this section omits any discussion of the potentially large impacts if a catastrophic incident, such as an earthquake or terrorist attack were to occur at the basins. The consequences of either of these events could be quite horrible.

R. Please see responses to Comment L06-C05 and Comment L06-C10.

L06-C39. Section 5.17, Adverse Environmental Impacts that Cannot be Avoided, page 5.118. As with the preceding sections, this section omits discussion of the potential impacts to the environment, and particularly to sensitive receptors or rare, threatened or endangered species from accidents.

R. Please see response to Comment L06-C36.

L06-C40. Section 5.18, page 5.119. There is no reasonably foreseeable need for any of this material as fuel in the future. There is also no reasonably foreseeable likelihood that U.S. policy prohibiting reprocessing will be changed to allow the separation of the uranium or plutonium from this waste.

R. Please see response to Comment L06-C17.

L06-C41. Section 5.20.3, Cultural Resources, page 5.123. If Native American remains are unearthed, construction may have to be halted, followed by construction at a new site.

R. This is correct. DOE's preferred alternative makes use of only previously disturbed sites.

L06-C42. Section 5.20.6, Ecology, page 5.124. The preference for previously utilized or disturbed sites is encouraging. If the record of decision selects a different site, the language in the record of decision needs to more than state what could be done to mitigate for habitat destruction. It needs to specify what will be done. This should include specific language detailing the amount of offsetting habitat improvement which will be carried out, commitment to use only native seed and plant stock, and to monitor the progress of this replacement development with adjustment in the plans as needed. It is not sufficient that there be a goal. The results of the habitat replacement must be the measure of its adequacy. Work needs to continue until the replacement habitat is fully functional and biologically equivalent to or greater than the habitat impacted.

R. Please see response to Comment L06-C01.

L06-C43. Section 5.20.10, Accidents, page 5.125-126. The potential severity of many of the accidents which may occur during the process of transporting and stabilizing the fuel are large. The chances of these accidents occurring are also large. The condition of the fuel in the basins both physically and chemically is substantially different from the baseline evaluations used in the emergency preparedness plans. This is especially true of a potential fuel fire under several scenarios (fuel drop, MCO overpressure, basin drain down). The Hanford Emergency Assessment Resource Manual (HEARM) and the K-Basins Facility Safety Analysis Report (FSAR) need to be updated to include more accurate estimates of the probability and potential severity of incidents at the K Basins and involved in stabilizing the fuel. These should also be included in sitewide emergency drills.

R. The K Basins Safety Analysis Report is in the process of being updated to provide more accurate estimates of the probability and potential severity of accidents at the basins. Accidents associated with each of the alternatives considered in the Draft EIS are appropriately evaluated in the EIS and documents referenced therein. Documents such as the HEARM, as well as the SARs, will be updated as appropriate.

L06-C44. Section 5.21, Environmental Justice, page 5.127-132. The EIS identifies the Native American populations in this section. It omits any discussion of USDOE's tribal treaty obligations. It also omits any discussion of the tribal treaty reserved rights of the Yakama Indian Nation, the Confederated Tribes of the Umatilla Indian Nation and the Nez Perce Tribe. All of the Hanford Site is impacted by these treaty reserved rights. The disproportionate impact to the tribes occurs primarily from USDOE's preventing tribal members from using the Site lands in accordance with the treaties.

R. Please see Section 6.9 of the Draft EIS and the response to Comment L05-C19. A discussion of tribal treaty rights as related to the Hanford Site is included in Section 4.2.4 of Volume 1, Appendix A of the DOE SNF PEIS.

L06-C45. Section 6.3, Radiation Exposure to Members of the Public, page 6.3. In addition to USDOE Order 5400.5, NRC and EPA regulations limit exposures to the public. These limits are being lowered and are expected to be published at 10 mrem per year. The USDOE standard is inadequate and is not limiting. Additionally, EPA limits public exposure via the water route to 4 mrem per year.

R. DOE Order 5400.5 provides dose limits for all pathways including those not covered by EPA's limits, most notably direct exposure and the food-crop ingestion pathway. DOE's individual annual limit of 100 mrem/yr for all pathways is further limited by EPA's 10 mrem/yr dose from airborne radionuclides (40 CFR 61) and EPA's drinking water standard of 4 mrem/yr (40 CFR 141). NRC regulations do not apply.

L06-C46. Section 6.8, Species Protection, page 6.5-6. The EIS recognizes that Washington has identified the shrub-steppe habitat as priority habitat on page 4.31, second paragraph, and that this habitat is home to a large number of species which are either listed or under consideration for listing as rare, threatened, or endangered by either the state or federal governments, pages 4.29-31. Each additional impact to this habitat will increase the pressures on these species. It is important that any replacement or rehabilitation of habitat be done using naturally derived seed and plant stock.

R. Please see response to Comment L06-C42.

L07-C01. The three wet storage alternatives are unacceptable because they can not fully assure protection of the environment.

R. DOE's preferred alternative is drying/conditioning with interim dry storage. (No human action can ever "fully assure protection of the environment.")

L07-C02. All wet storage alternatives are susceptible to a seismic induced breach of the storage basin allowing complete drainage of water. A complete loss of water would lead to autoignition of the spent nuclear fuel. This accident scenario is not discussed along with environmental impacts from such an event. The new wet storage alternative fails to discuss a seismic scenario.

R. See Section 5.15.5 of the Draft EIS (page 5.88 and following) and response to Comment L06-C10. A seismic scenario for wet storage in the 200 Area is bounded by the seismic scenario for wet storage in the 100 Area; that is, the consequences associated with such a scenario are more severe at the 100 Area than further from the Site boundary, as at the 200 Area.

L07-C03. Under the drying/passivation alternative, WDFW is concerned with the uncertainties which exist regarding the chemical state and pyrophoric nature of the spent nuclear fuel in the KE and KW Basins. This EIS fails to adequately discuss these uncertainties and to what extent these uncertainties would have on the environment.

R. See Section 1.6 of the Draft EIS and the responses to Comment T27a and Comment L05-C04. DOE is conducting a characterization program to determine both the chemical state and pyrophoric nature of the SNF.

L07-C04. WDFW has determined the option under the preferred alternative, utilizing the reference site for facility siting, to be unacceptable. The reference site is clearly outside the exclusive waste management area recommended by the Hanford Future Site Uses Working Group.

R. DOE's preferred alternative does not make use of the reference site. The reference site is, however, within the Central Plateau area recommended by the Hanford Future Site Uses Working Group for waste management activities.

L07-C05. The discussion for foreign processing fails to mention any potential ecological accidents.

R. Please see response to Comment L06-C36.

L07-C06. Mitigation is discussed briefly in the summary. Loss of State Priority habitat should be mitigated through compensatory mitigation such as that mentioned in the summary on page vii. However, this concept is lacking elsewhere in the document. This EIS should commit to a project specific Mitigation Action Plan to perform compensatory mitigation at a 3 to 1 replacement ratio for habitat loss, and the 3 to 1 ratio should be stated in the EIS.

R. Please see response to Comment L06-C01.

L07-C07. The EIS should provide a description of the habitat which was present at the CSB prior to site clearing. If a biological assessment was not performed prior to site clearing, then the most recent aerial photographs (prior to CSB site clearing) should be used to assess preexisting habitat conditions (value). It may be appropriate for the Spent Nuclear Fuel EIS to provide compensatory mitigation for the loss of habitat value which occurred from the CSB site clearing.

R. Mitigation for the loss of habitat which occurred when the CSB area (located within the 200 East Area) was cleared is outside the scope of this EIS.

L07-C08. Section 4.9.1, first paragraph, second sentence. Suggest changing the word "productivity" to the word "diversity."

R. Productivity is the correct term. "Productivity" refers to the production of biomass, whereas "diversity" refers to the variety of species present.

L07-C09. Section 4.9.3, page 4.29, first paragraph, last sentence. Request the following sentences be inserted prior to last sentence. "The Hanford Reach contains the last significant spawning habitat for Fall Chinook salmon. In addition the Hanford Reach comprises the only significant remaining section of the Columbia River where white sturgeon are able to spawn."

R. DOE agrees.

L07-C10. Page 4.29, Section 4.9.4. This section should mention that the National Biological Service has designated shrub and grassland steppe as an endangered ecosystem in the states of Washington and Oregon.

R. The National Biological Service issued a report in which the authors declared native shrub and grassland steppe to be an endangered ecosystem in Oregon and Washington (not necessarily the policy of the National Biological Service). This is different from a "critical habitat" designated under the Endangered Species Act (the subject of Section 4.9.4 of the Draft EIS).

L07-C11. Section 5.2.2. Refer to general comments regarding reference site.

R. Please see response to Comment L07-C04.

L07-C12. Page 5.38, Figure 5-1. Refer to general comments regarding reference site.

R. Please see response to Comment L07-C04.

L07-C13. Page 5.113, Section 5.16.1. WDFW has found the discussion on cumulative impacts to be inadequate. The destruction of 20 acres of State Priority habitat along with past, present, and future actions will have a significant effect on the flora and fauna of the Central Plateau, Hanford Site. Other projects which have had impacts to State Priority habitat include: Environmental Restoration Disposal Facility (ERDF) (165 acres minimum; potentially impacting 1024 acres), Safe Interim Storage EIS (74 acres), 240 access road (18 acres), Solid Waste Retrieval Complex (46 acres), Tank Waste Remediation System EIS (148 acres). The National Biological Service has designated shrub and grassland steppe as an endangered ecosystem in the states of Washington and Oregon.

R. DOE's preferred alternative will not require the destruction of priority habitat. The land areas cited in the comment, including 1024 acres for the ERDF and 20 acres for use of the reference site (if it were used), sum to 1,330 acres. DOE is sensitive to the problem of destruction and fragmentation of habitat and is working to minimize destruction or to mitigate the consequences where destruction is unavoidable. See responses to Comments L06-C01 and L07-C10.

L07-C14. Page 5.119, Section 5.19. This section should include a statement which commits to restoring the land with native vegetation once the facilities are decommissioned.

R. Please see response to Comment L06-C01.

L07-C15. Page 5.120, Section 5.20. Please refer to general comments on mitigation.

R. Please see response to Comment L06-C01.

L08-C01. The DEIS makes no mention of what USDOE headquarters is calling "materials-in-inventory" (MIN) of which the SNF is considered part. How will the preferred alternative be affected if the material is or is not valued as surplus inventory? If it is determined as excess, and therefore a waste, what contingencies are provided?

R. DOE's preferred alternative allows management of SNF at Hanford either as a resource or as a waste at some later date.

L08-C02. New construction activities involving new septic systems should be integrated into the Hanford-wide infrastructure plan.

R. Septic systems at the Hanford Site are constructed and operated according to applicable Washington State standards.

L08-C03. At several points, the transport analysis assumes roads used for transport are not open to the public. (See page 3.13, 5.55, and the explicit statement on page 6.1 that "shipments would occur exclusively on federal government property...where access is controlled at all times through the use of gates and guards.") It is no longer true that access to the road network between 100-K and 200-E is controlled at all times by guards and gates. Under new security arrangements, unauthorized persons can in fact be on those roads, albeit illegally. In the past, USDOE has committed to temporary road closures for on-site shipments of materials not meeting the standards established in 10 CFR 71 or 49 CFR 171-78. Even though the transport of liquid sludges would not meet these standards, there is no indication the road closures have been contemplated.

R. No one is allowed beyond the gates on the Hanford Site without appropriate badging. Gate access to the Site is guarded 24 hours a day. The roads between 100-K and 200-E are behind the gates and are not open to the public. Road closures within the Hanford Site are typically for safety purposes because of slow-moving or oversize vehicles. All necessary precautions will be taken to ensure the safety of any transport operations.

L08-C04. The analysis in Appendix B is both thorough and covers transport issues reasonably well. In particular, USDOE is to be commended for providing dose estimates for maximally exposed individuals resulting from accidents (Tables B-19 through B-25). There are, however, a few points that need clarification:

Severity categories (page B.42). The DEIS identifies six severity categories based on a reference to the Spent Fuel Management and Idaho National Engineering Laboratory EIS, which relies on a matrix of 20 cells for the "modal study." The Draft Waste Management Programmatic EIS uses eight categories based on the Nuclear Regulatory Commission technical document NUREG 0170. Considering the public's concern with the potential impacts of a maximum credible accident, it would be beneficial to be clear and consistent in addressing this topic.

R. The severity categories used in this analysis are based on the 20 severity categories identified in the NRC modal study. The 20 severity categories were collapsed into six severity categories. Within each of the six collapsed categories, there is no difference in the release quantity or in the calculated consequences. Thus, the time required to manage the data and to calculate the results are reduced. This method does not reduce the accuracy of the results or change the calculated consequences.

Impact assessment (page B.36). The narrative describing the information presented in Table B-11 identifies rail shipments of SNF to the Port of Seattle as the lowest impact alternative. Yet, Table B-11 appears to show barging to Portland as having the lowest impact, which is confirmed in the first full paragraph on page B.37.

R. The text is incorrect. Barging has the lowest impact.

Table B-20. Page B.50, there is no explanation for the two-fold calculations shown in Table B-20.

R. The first three are for truck transport and the last three are for rail transport.

L09-C01. It is difficult to make judgments as to the costs or technical merit of options that have never been put into practice and for which there is not even a conceptual design in place, such as the "preferred alternative" (drying/passivation with dry storage). Furthermore, this preferred alternative is not a substitute for processing (rather, it only postpones the need for processing), and thus will add to the total lifecycle costs when compared to the processing alternative alone. As an illustration of this situation, the Department recently selected processing as the preferred alternative for managing Mark-16 and Mark-22 targets (Federal Register, Vol. 60, No. 243, pp. 65300 - 65316), because the processing alternative resulted in incremental cost savings and eliminated the large uncertainties associated with the ultimate disposition of this material when compared to the nonprocessing options. Furthermore, in making this decision on the Mark- 16 and -22 targets, DOE felt that, even though all the alternatives considered were technically "feasible," the more an alternative varied from the "historical processes and facilities" previously used, the greater the technical uncertainty and the greater the extent to which new facilities would be required. In contrast, the overseas processing alternative is a proven technology, with well-established costs, and demonstrated track record (case in point: the canning, transport, and processing of the heavily damaged metallic fuel from Sallugia/Latina), and therefore can be accomplished readily with no uncertainties, rendering the fuel stable for permanent disposal without going through an interim, costly storage regime.

R. The cost and schedule advantages of the dry storage alternative were the principal factors in selecting it as the preferred alternative. Also, as stated in the Draft EIS, processing might be required in the future to facilitate ultimate disposition of the SNF. However, DOE is currently evaluating whether emplacement of the N Reactor fuel at a geologic repository, after interim dry storage and without further processing, would be acceptable. Both French and British experiences with heavily damaged metallic fuel were considered in developing the drying/passivation with dry storage alternative.

L09-C02. Page 3.2 - "New wet storage alternative" - disadvantages. Further hydriding is less of a problem if it occurs with free access to oxygen, such that only low concentrations of UH_3 are formed. Hydride becomes a problem only if oxygen is excluded (yielding higher UH_3 concentrations in corrosion product) and there is a subsequent possibility of exposing the fuel to air.

The main disadvantage of wet storage is the continued rate of corrosion of the exposed fuel generating more sludge and rendering the fuel more difficult to handle. Thus, a philosophy of maintaining damaged fuel wet with free oxygen access can work for short term storage (a few years).

R. As noted in the comment, a significant disadvantage of continued wet storage is further fuel corrosion and resultant sludge generation. Additionally, the costs associated with operation and maintenance of a wet storage facility are higher than for a dry storage facility. While providing free access to oxygen will indeed reduce or eliminate hydride, it also results in the potential for the release of radioactive contaminants from the fuel storage canisters. Thus, significant additional engineered systems for contamination control would be required.

L09-C03. Page 3.3 - "Drying/passivation with dry storage." Vacuum conditioning at 300C will probably remove water, but given the large inventory of fuel in each MCO, it will be impossible to know how successful this has been. Any water remaining will continue to generate hydride.

R. The conditioning process will remove sufficient free and bound water to ensure that requirements for safe interim storage of the fuel are satisfied. See also the response to Comment T27a and Comment L05-C04.

L09-C04. Page 3.5 - "Foreign processing." The principal disadvantages are quoted as relating to transport, shipping, casks and cost of a new head end. The transport issues are really insignificant - this has been done before (ref. Sallugia/Latina) without incident and a full safety case was produced. There certainly would have to be more risks assigned to the other alternatives as compared to the known, demonstrated, manageable risks associated with transport of this fuel (metal fuel is regularly transported internationally without incident). A new head end at the processing facility is no more of an uncertainty or cost than the proposed drying/passivation plant and has the advantage of being based on existing proven technology. There should be little or no staging required for off-site shipment of fuel for foreign processing. The fuel can be removed from the basin as it is shipped, and shipping schedules can easily meet the required basin emptying timescales.

R. The risks and principal disadvantages of foreign processing as stated in the Draft EIS are believed to be correct, and are consistent with previous transportation safety assessments (see, for example, DOE 1995a). The uncertainties referred to in the cited section of the Draft EIS are principally associated with the feasibility, from a policy and public opinion viewpoint, of shipping the degraded fuel overseas, not with the costs of casks or facilities. The Programmatic Final EIS (DOE 1995a) addresses these concerns in Section B.5 of Appendix A.

L09-C05. Page 3.29 - "Drying/Passivation (Conditioning) for Dry Storage." Controlled admission of oxygen would certainly stabilize some of the finely divided uranium. However, there would be no guarantee that all such material was stabilized. Under controlled oxidation the uranium will form a very thin protective coating of oxide which could be removed by subsequent abrasion, revealing further pyrophoric surfaces. The swelling associated with oxidation could effectively seal off extensive regions of unpassivated material.

R. The drying/passivation process will sufficiently stabilize the fuel for safe interim storage, as described in the Draft EIS. Additionally, the storage method will utilize defense-in-depth principles (e.g., multiple barriers against the introduction of air) to further assure safe storage. See also the response to Comment T27a and Comment L05-C04.

L09-C06. Page 3.39 - "Foreign Processing Alternative." Final disposition of the fuel will be much more expensive in the future if a dedicated processing facility has to be constructed specifically for this fuel. There is no option to dispose of passivated metallic fuel directly. Irradiated uranium metal will never be suitable for disposal in a repository due to its reactivity.

R. Please see response to Comment L09-C01. A dedicated processing facility would likely never be constructed specifically for this fuel.

L09-C07. Pages 3.40 - 3.42 - "Packaging, Transport and Processing." The nine year period for shipment of fuel for foreign processing is excessive. There is no transport constraint which dictates this long a program. Seven years can be achieved easily, and given sufficient casks, the fuel can be transported as quickly as it can be removed from the basin (i.e., on the same timescale as any other option). The figure used for number of shipments

(4000) has to be a typographical error. BNFL's estimates assumed 600 shipments, on the basis that the shipments would be completed in 5-7 years (not the 9 years shown in Figure 3.11).

R. The 4,000 shipments stated in the Draft EIS is an error. The analyses in the Draft EIS were, in fact, done on the basis of three shipments of 24 casks of SNF per year; i.e., 72 casks per year, over a span of 8 years for a total of 24 shipments. These numbers were arrived at as follows: since each cask can hold 3.7 metric tons of SNF and since there are 2,100 metric tons of SNF to be shipped, a total of 568 casks must be shipped. At the time the analyses were performed, the information available on shipping capacity provided the three shipment per year limit. Thus, at the assumed rate of 72 casks shipped per year, it would require about 8 years to ship all of the SNF, not the 9 years shown in Figure 3-11, which is also in error. See also the response to Comment L09-C04.

L09-C08. Pages 3.5, 3.43, and 5.80 - "Returned Vitrified Waste." Vitrified waste does not have to be returned to Hanford. It can be returned directly to the U.S. repository when this becomes available.

R. This is correct, pending establishment of agreements for long-term storage of vitrified waste in the U.K. and if the foreign processing alternative were implemented. The impacts for return of the material to the U.S. are not significant and were included to cover potential impacts should contract negotiations result in return of the material to the U.S. due to costs or other factors.

L09-C09. Page 5.37 - "Processing Alternative." Scenarios and consequences relating to water quality do not apply in the case of foreign processing. There are none.

R. DOE agrees. Section 5.8.6 on page 5.37 is intended to refer to onsite processing.

L09-C10. Pages 5.133-5.143 - "Costs." The foreign contract costs quoted are \$0.3B to \$0.5B higher than the estimates given by BNFL. In contrast, the cost of the drying/passivation process seem to be underestimated (no allowance for development) and the costs for on-site processing have been underestimated (no allowance for restart of the PUREX Plant, if it could be done at all). If DOE wants to be consistent throughout, then it should use the lower range of the overseas processing figures, i.e., approximately $ 1.9B. This is a lifecycle cost and should be compared with the sum of drying/passivation and subsequent on-site processing - i.e., $3.7B. Drying/passivating does nothing to make final preparation for disposal any easier. It may limit expenditures in the short term ($1B) and defer the rest ($2.7B) for up to 40 years, but carries with it the risks of technical inadequacy - especially if no development is planned or budgeted for the final stabilization process. Postponing the final stabilization for even a few years runs the risk that overseas processing will not be available at a later date, either due to capacity commitments or end-of-life of the processing plant. One aspect of the overseas reprocessing costs that was not addressed in the text is the phasing of the payments, wherein the costs for transportation would not be due until fuel is actually delivered to the processing plant, and wherein the costs of the reprocessing are phased over time, as opposed to requiring a "lump sum" sort of fiscal commitment.

R. Two sets of costs were provided by BNFL. The first set is contained in "UK Based Processing as a Spent Fuel Management Option for USDOE," dated 10/05/94, which indicated a price range for the 2,100 metric tons of N-Reactor fuel to be $1.0 billion to $2.5 billion. The second set of values is contained in a letter from Colin Boardman of BNFL to Kathy Rhoads of PNL dated December 16, 1994, which indicated a price range from $1.3 billion to $2.0 billion. For conservatism, the larger value for both ends of the range was selected. The $2.5 billion was rounded up to $3 billion in error. The range in Figure 5-8 should be $1.3 billion to $2.5 billion for contract costs. As a result, the life-cycle cost range for the foreign reprocessing should be $2.2 billion to $3.4 billion and the 40-year storage cost range should be $2.1 billion to $3.3 billion. On-site processing costs include $1.283 billion to construct and operate a new reprocessing facility, $250 million to deactivate that facility, and $450 million to decommission that facility, for a total of $1.983 billion for the reprocessing portion of the effort, which is not very different from the $1.3 billion to $2.5 billion range proposed by BNFL. The cost estimate for the drying/passivation alternative assumes that no further treatment of the SNF would be required.

L09-C11. General Comment on Transportation. The assumptions regarding transportation risks are, in general, quite negative. In fact, however, BNFL's experience in transporting similar fuel around the world over the past 40 years speaks for itself and is the real measure of the relatively small risk inherent in such an undertaking.

R. The computer codes and input data used to evaluate transportation risks for all alternatives in the Draft EIS are believed by DOE to be appropriate and consistent with previous analyses. See also the response to Comment L09-C04.

L10-C01. The K Basins are in a serious state of disrepair. Do not let the new facility also deteriorate.

R. DOE plans to send SNF from the new storage facility to a repository, when it becomes available. DOE intends to maintain the SNF and any associated facilities located at Hanford in such a condition as to facilitate the eventual transfer of SNF to a repository.

L10-C02. Obtaining a copy of the EIS was very difficult.

R. DOE placed a notice of intent to prepare the EIS and a notice of availability of the Draft EIS in the Federal Register; held public scoping meetings in Portland, OR, Richland, WA, Seattle, WA, and Spokane, WA; advertised those public meetings in newspapers in the cities where the meetings were held; held a public hearing on the Draft EIS in Richland, WA; and advertised that public hearing in display ads in newspapers in Portland, Richland, Seattle, and Spokane, as well as in the *Hanford Reach*. Each notice and advertisement contained instructions on how to obtain further information.

L10-C03. I was strongly discouraged by both my contractor management and by DOE management not to attend the public meetings. I have seen several employees...who have been harassed by management for attending public meetings and asking questions. It was certainly surprising to see how poorly workers who asked questions were treated.

R. DOE does not discourage DOE employees or contractor employees from attending and/or speaking at public meetings. In addition, both DOE and the contractors have confidential processes in place by which employees can express concerns. DOE is not aware that any person was poorly treated at the December 12, 1995, public hearing or that any question went unanswered.

L10-C04. There is not the [time] crisis that DOE is trying to create. Another year or two would not cause undue harm to the public. Yet those 2-3 years in the schedule could make the difference between a high risk, high exposure to the workers and a very well designed, safe transfer. Do not put the workers at risk to high exposure, excessive hours, etc. just to meet your artificial and self serving schedule date. The tax payers are also the losers because we have to pay much more for your "rush," as well as potentially have more risk to the public. DOE's focus should be to do the minimum amount of work in the 100 K Area and get the fuel out as soon as possible.

R. DOE agrees with the writer and with the assessments of the Defense Nuclear Facilities Safety Board and the Hanford Advisory Board that the SNF should be removed as soon as possible from the K Basins (see Section 1.4 of the Draft EIS). DOE does not, however, regard the preferred alternative as a high risk, high exposure activity; the fuel handling processes will be planned and engineered to reduce exposure to the workers to as low as is reasonably achievable. Some recent dose reduction activities have already lowered general area dose rates in the KE Basin. Quickly moving the SNF out of the basins will save the taxpayers money, since each month the basins continue to operate costs about $3 million. However, DOE will not compromise the safety of workers or the public to make this happen.

L10-C05. Do not process fuel at the 100 K Area. There was a VERY brief discussion in the EIS about a "cold vacuum drying" facility at 100 K. It appears you purposely downplayed the risk and description of this in the EIS to disguise this new processing facility at the river. 50 degrees C is not all that cold and if I understood the description, this is clearly processing. I thought DOE committed that they would not be building new operating/ processing facilities near the river. This does not make good financial sense either. If DOE does its usual thing, this "new processing facility" will be built to excessive criteria to meet huge earthquakes and tornadoes, etc. (not that we should see them in the 3-4 years this building will be used). It will obviously have to have a state of the art air filter system with all the processing. Yet this new asset that should be available for other cleanup activities, will be placed in an area inaccessible to any other major site. All new buildings should be located in the central 200 Areas. For good of both public and the workers, all new processes should be done in the 200 Areas. DOE's focus should be to do the minimum amount of work in the 100 K Area and get the fuel moved out as soon as possible. This means not setting new and aggressive standards on the old facility and process. This is usually done under the excuse of safety, but often ends up with actually increasing the risk to the workers and nearby residents. Please, before you blatantly apply rules (NRC, tornado, etc.) look at the real risk savings. It is one thing to design the new 40 year storage facility to very stringent standards, but the facilities that have a 2-5 year life should just meet the absolute minimum.

R. In choosing its preferred alternative, DOE considered tradeoffs of processing location, schedule, and cost. Performing vacuum drying of the SNF at the K Basins offered the best schedule and cost advantages while, at the same time, actually reducing the risk associated with transporting damaged SNF by eliminating concerns for overpressurization of the MCOs. The drying facility will be designed to meet safety and environmental requirements, but the design will take into consideration the short duration over which it will be required to operate so as to reduce costs.

L10-C06. And that excuse that the fuel must be shipped dry is one of the worst excuses I have heard from DOE yet. How many thousands of shipments have been made wet from the 100 Areas to the 200 Area? For the good of both public and the workers, all new processes should be done in the 200 Areas and the fuel should be removed and shipped in the same manner (well cars by train) that has been successfully demonstrated for years. Then unload them into a small water pool for trans-loading and processing in a building DESIGNED for that (e.g. filters, remote handling tools, etc.). It likely would not even cost more, since the very expensive shipping trucks and casks would not be needed. It would also use existing equipment on site.

R. Wet shipping of the very large amount of SNF in the K Basins (some of which is badly damaged) in unsealed containers does not provide sufficient containment. Fuel has been shipped wet in the past, but it has not been fuel with this extensive amount of corrosion. An exception was made for the recent shipment of a small amount of SNF from the PUREX facility to the KW Basin because it was necessary to consolidate the SNF and there is currently no capability to vacuum dry SNF.

L10-C07. Don't use trucks. Use the train system. The trains at Hanford have a FANTASTIC safety record. We already are having continued problems with big crawlers and multiple trucks on the road for cleanup and solid waste. If you must use trucks, the road from the 200 Area to 100 K should be totally redone. It is not designed for these big and steady loads. There are already bad potholes, no shoulders, narrow lanes, and little passing areas (with lots of big animals that run across the road). Whoever picked trucks over the train has NEVER had to drive that road over a one year period. On page 5.53, even your own data show that trains are much better. If you honestly assessed the cost of road upgrade and repair, then the cost of train or truck would probably be the same.

R. Both truck and train transportation have acceptably low risk. However, truck transportation has a lower estimated cost, even when road upgrades, which might be necessary, are included.

L10-C08. Prior to proceeding down your preferred option, you should balance the ALARA dose to workers (for having to do more work in a building DOE never kept up) and to the fishermen by the river bank against the small risk of shipping via the existing train system to the 200 Area and doing all process/handling work in a new filtered facility.

R. Please see response to Comment L10-C04.

L10-C09. DOE should look at the potential savings of designing a proper MULTIUSE storage facility (for some of the high dose transuranic garbage, vitrified tank wastes, spent fuel, etc.). It would not be surprising for a small increment increase, this new building can be a big asset for the cleanup, and not a one-subject item. Use the systems engineering tools you brag about.

R. A part of the approximately $350 million to be saved by adopting DOE's preferred alternative comes from beneficial reuse of an existing building design and its already-constructed basepad. The resulting Canister Storage Building (CSB), as noted in the Draft EIS, will be larger than necessary to accommodate the K Basins SNF. DOE is evaluating use of the excess capacity in the CSB for storage of other Hanford materials, such as vitrified tank waste or the cesium/strontium capsules currently stored at the Waste Encapsulation and Storage Facility.

T-24. An EIS is required in cases where the government proposes an action that may have a significant impact. But Table 3-2 shows that the impacts are rather trivial. Are we delaying getting on with the important work of cleaning up Hanford by spending rather large sums of money and time in order to carry out a legal mandate to follow NEPA procedures? DOE should attempt to find some way to be sure that it can avoid breaking the law but at the same time expedite the process in the interest of saving money and time.

R. DOE NEPA regulations (10 CFR 1021) in Subpart D, Appendix D, require that the siting, construction, operation, and decommissioning of major treatment, storage, or disposal facilities for SNF be treated as actions that would typically have an EIS. DOE is working to streamline the NEPA process to reduce cost and speed up the preparation of EISs.

T-26a. I was rather disappointed in the cavalier treatment of the Washington Public Power Supply Systems use alternative. This was dismissed in about one sentence as being too close to the river and potentially involving some lengthy procedure for acquisition of those facilities.

R. The statement in the Draft EIS regarding the use of the Supply System's spray cooling pond for SNF storage was intended to be a succinct statement of the disadvantages of that alternative.

T26b. I'm surprised that DOE was willing to consider shipping 2,000 tons of spent deteriorated fuel to Britain for reprocessing.

R. Foreign processing was included in the K Basins SNF EIS because it is an action within the purview of the U.S. Government and because it was considered in the SNF Programmatic EIS. Foreign processing is not DOE's preferred alternative.

T-27a. I think that the long-term stability of uranium metal material is not assured and probably cannot be fully assured in the brief period that you have until the passivation treatment begins.

R. Metallic uranium is thermodynamically unstable; thus, especially in the presence of water or water vapor, it will react (corrode) to form oxides. These reactions generally occur slowly and the energy they release in the form of heat does not represent a concern. It is also possible that uranium hydride may be formed in the uranium corrosion process. Uranium hydride is also unstable and can, in the presence of oxygen, rapidly react. The heat generated in this rapid reaction can cause the hydride to burn. In the preferred alternative (and in all other alternatives) the process involving handling of the SNF will be engineered to prevent oxygen in sufficient quantity to support burning from coming into contact with the fuel. In the period between the cold vacuum drying and hot vacuum conditioning (passivation), some slow corrosion of the fuel is anticipated, because a small amount of residual bound water cannot be ruled out. This may result in hydrogen generation and a corresponding buildup of pressure within the multicanister overpack (MCO). However, the MCOs will be designed to hold 150 pounds per square inch of pressure, which would not be reached during this brief period.

T-27b. There should be some provision for assuring leak tightness and containment of the inert atmosphere within the multi-canister containers over the long storage life.

R. Please see response to Comment L05-C04 and Comment T27a.

3.0 ERRATA

Errata associated with each section of the Draft EIS are provided below beneath the title of the section.

SUMMARY

Page iv, first full paragraph - replace 4th sentence with "Drying/passivation (conditioning) with dry storage means to remove SNF from the K Basins, condition [i.e., dry (remove free and bound water), then oxidize exposed reactive areas of the fuel under controlled conditions], seal in canisters filled with an appropriate storage atmosphere, and provide for up to 40 years of dry storage in a new vault or cask facility."

Page v, first full paragraph - replace 4th sentence with "Among the other alternatives, wet storage is a proven technology for undamaged commercial spent fuel, although continued wet storage of the damaged N Reactor fuel will result in continued degradation of this SNF."

Page viii, third paragraph - Change next-to-last sentence to read "Nitric acid would be required in quantity for calcination and twice that for..."

GLOSSARY

Page xxii - add the following new term under **sulfur oxides:**

> **transportation index**. As defined in 40 CFR 173.403(bb), the transportation index is the highest package dose rate in millirem per hour at a distance of 1 m from the external surface of the package.

1.0 INTRODUCTION

There are no errata associated with this section.

2.0 PURPOSE AND NEED

There are no errata associated with this section.

3.0 DESCRIPTION OF ALTERNATIVES AND COMPARISON OF IMPACTS AMONG THE ALTERNATIVES

Page 3.2, second bullet, second paragraph, third line: - change to read "... would make use of a proven storage technology (at least for commercial reactor fuel) coupled with...".

Page 3.2, second bullet, third paragraph, second line: - change to read "... continued maintenance, would not prevent the continuation of SNF degradation, and would not eliminate...".

Page 3.2, third bullet, second line - change to read "...K Basins, condition [i.e., dry (remove free and bound water), then oxidize exposed reactive areas of the fuel under controlled conditions], seal in canisters...".

Page 3.3, ninth bullet, third line - change to read "...200 Area State-Approved Land Disposal Site (SALDS)." Delete the last sentence.

Page 3.6, first full paragraph, first sentence - change to read "For reasons described in Section 3.2.8...".

Page 3.7, seventh bullet, last sentence - change to read "... and fire protection features in the KE and KW Basins, 165-KE ...".

Page 3.12, next-to-last paragraph, first sentence - change to read "1. **retrieval of the sludge**: sludge may be retrieved using automated equipment, remotely operated equipment...".

Page 3.17, second full paragraph, second sentence - change to read "... as described in the no action alternative in Section 3.2.1, with...".

Page 3.19, third full paragraph, first sentence - change to read "...are the same as described in Section 3.2.2, except...".

Page 3.20, last paragraph, second sentence, - change to read "...store all the K Basins fuel (750 MCOs) and the KE Basin floor sludge (70 MCOs)."

Page 3.40, first paragraph after bullet list, second sentence - change to read "The schedule in Figure 3-11 assumes maximum cask payloads and three shipments a year with 24 casks per shipment, for a total of 576 cask loads in 24 shipments to remove all the SNF from the K Basins."

Page 3.41, Figure 3-11 - replace with corrected Figure 3-11.

Page 3.51, Table 3-2 (contd), first row under "Foreign Processing" column - change to read "2.1 - 3.3". Change second row in same column to read "2.2 - 3.4".

Page 3.52, fourth paragraph, next-to-last sentence - change to read "Nitric acid would be required in quantity for calcination and twice that in...".

Page 3.53, first full paragraph, first sentence - change to read "... range from about $1 billion to $3 billion." Change fourth sentence to read "The cost of foreign processing would range from about $2 billion to about $3 billion." Change last sentence to read "... and about $3 billion for the no action and...".

4.0 AFFECTED ENVIRONMENT

Page 4.1, second paragraph, first sentence - change to read "...shrub-steppe habitat with big sagebrush...".

Page 4.14, last paragraph, last sentence - change to read "... and is classified as Uniform Building Code Zone 2B."

Page 4.29, paragraph at top of page (continued from Page 4.28) - insert two new sentences before the last sentence as follows: "The Hanford Reach contains the last significant spawning habitat for fall Chinook salmon. In addition, the Hanford Reach comprises the only significant remaining section of the Columbia River where white sturgeon are able to spawn.".

5.0 ENVIRONMENTAL CONSEQUENCES

Page 5.2, first full paragraph, next-to-last sentence - change to read "The no action and the foreign processing alternatives would...".

Page 5.33, second paragraph, last sentence - change to read "... with a population risk of 8.3 x 10^{-5} latent cancer fatalities."

Page 5.35, first full paragraph, third sentence - change to read "...with a population risk of 4.1 x 10^{-6} latent cancer fatalities."

Page 5.35, third full paragraph, first sentence - change to read "...with a population risk of 7.1 x 10^{-8} latent cancer fatalities."

Page 5.37, second paragraph - change to read "... relating to water quality for the onsite processing alternative...".

Page 5.66, Table 5-44 - change entry for "Stainless steel for Mark II canisters" to read "200 MT (220 tons)". Add a new row under this corrected entry to read " Carbon steel for storage racks 100MT (110 tons)".

Page 5.67, first paragraph - change heading to read "**5.13.3 New Wet Storage Alternative**" and replace the paragraph with the following: "This alternative requires material for casks and canisters, and water for sludge and tritium treatment during and following SNF removal from the K Basins. Table 5-45 shows the resources required to remove and transport the sludge and water from the K Basins. The resource requirements for two approaches to the new wet storage alternative are discussed below."

Page 5.67, second paragraph, first sentence - change to read "This approach requires...".

Page 5.67, third paragraph, first sentence - change to read "This approach requires...".

Page 5.67, Table 5-45 - change first row to read "Electricity 6,000 MWh/yr". Change entries following "Stainless steel For placing sludge in MCOs" to read "100 MT (110 tons)". Change entries following "Carbon and alloy steel for shipping casks" to read "65 MT (71.6 tons)"

Page 5.68, Table 5-46 - change entry following "Electricity (for operations) at either site" to read "14,400 MWh/yr".

Page 5.69, second paragraph - change to read "This activity requires ...".

Page 5.69, third paragraph - change to read "This facility offers ...".

Page 5.69, fourth paragraph - change to read "This facility requires ...".

Page 5.69, fifth paragraph - change to read "This facility requires ...".

Page 5.70, Table 5-49 - change entries following "Copper" to read "11 MT (12.1 tons)". Change entries following "Stainless steel for construction" to read "170 MT (187.4 tons)". Change entries following "Carbon and alloy steel" to read "530 MT (584.2 tons)". Change last entry in row labelled "Water For construction" to read "(2,114,000 gal)". Change last entry in row labelled "Water For operation" to read "(1,057,000 gal/yr)".

Page 5.71, Table 5-50 - change entries following "Copper" to read "59 MT (65 tons)". Change entries following "Water For operation" to read "20,000 m^3/yr (5,280,000 gal/yr)"

Page 5.76, paragraph at top of page, last sentence - change to read "The KE Basin contains approximately 4,500 m^3 (1.2 million gal) of water."

Page 5.81, Table 5-55, last line - change to read "Foreign processing".

Page 5.91, second paragraph, second sentence - change to read "... (i.e., 600,000 gal/8-hours over an area of 6.4 acres ...".

Page 5.91, third paragraph, next-to-last sentence - change to read "... with a population risk of 1.3 x 10^{-4} latent cancer fatalities." Change last sentence to read "... with a population risk of 2.9 x 10^{-7} latent cancer fatalities."

Page 5.101, Table 5-67, footnote (a) - change cited table in Bergsman et al. 1995 to Table 3-21, in two places.

Page 5.105, Table 5-70 - change title to read "... (Bergsman et al. 1995, Table 3-26)".

Page 5.122, Table 5-74 (contd) - in row labelled "Life cycle" change entry under "Passivation Dry Storage" to read "1.1".

Page 5.133, last paragraph, second sentence - change to read "The costs for all of the Hanford activities ...". Insert a new sentence before the last sentence on this page to read "Costs for foreign processing are derived from BNFL (1994a) and BNFL (1994b).".

Page 5.141, Figure 5-8 - change text under box labelled "Foreign Contract" to read "1.3B - 2.5B"

6.0 REGULATORY REQUIREMENTS

There are no errata associated with this section.

7.0 REFERENCES

Page 7.1 - add two new references directly below the 9th reference as follows:

"BNFL (British Nuclear Fuels Limited). 1994a. "*UK-Based Processing as a Spent Fuel Management Option for USDOE*", British Nuclear Fuels, Inc., Washington, D.C.

BNFL (British Nuclear Fuels Limited). 1994b. Letter from Colin Boardman (BNFL) to Kathy Rhoads (PNL) dated December 16, 1994.

8.0 PREPARERS

There are no errata associated with this section.

APPENDIX A - INVENTORY AND FACILITY DESCRIPTIONS

Page A.1, last paragraph - change last sentence to read "... in KE (Bergsman 1994)."

Page A.19, Figure A-8 - replace with correct Figure A-8, attached.

Page A.21, Figure A-9 - replace with correct Figure A-9, attached.

Page A.24, Figure A-11 - replace with correct Figure A-11, attached.

Page A.26, under A.6 References - replace first reference with the following: "Bergsman, K. H. 1994. *Hanford Spent Fuel Inventory Baseline*. WHC-SD-SNF-TI-001, Rev. 0, Westinghouse Hanford Company, Richland, Washington."

APPENDIX B TRANSPORTATION IMPACT ANALYSIS

Page B.10, second full paragraph, second sentence - change to read "All scenarios assume packaging, as necessary, ...".

Page B.36, paragraph at bottom of page, first sentence - change to read "From a domestic transportation perspective, the lowest impact option is moving the SNF from Hanford to the Port of Portland by barge." Change second sentence to read "This option is followed closely by moving the SNF from Hanford to the Port of Seattle by rail."

Page B.50, Table B-20 - replace the body of this table with the following:

Transportation Route	TEDE (rem)
By Truck:	
Hanford, Washington, to Portland, Oregon	0.26
Hanford, Washington, to Seattle, Washington	0.118
Hanford, Washington, to Norfolk, Virginia	0.26
By Rail:	
Hanford, Washington, to Portland, Oregon	0.98
Hanford, Washington, to Seattle, Washington	1.27
Hanford, Washington, to Norfolk, Virginia	1.27
TEDE - 50-yr Total Effective Dose Equivalent	

APPENDIX C - NOISE ANALYSIS

There are no errata associated with this section.

INDEX

There are no errata associated with this section.

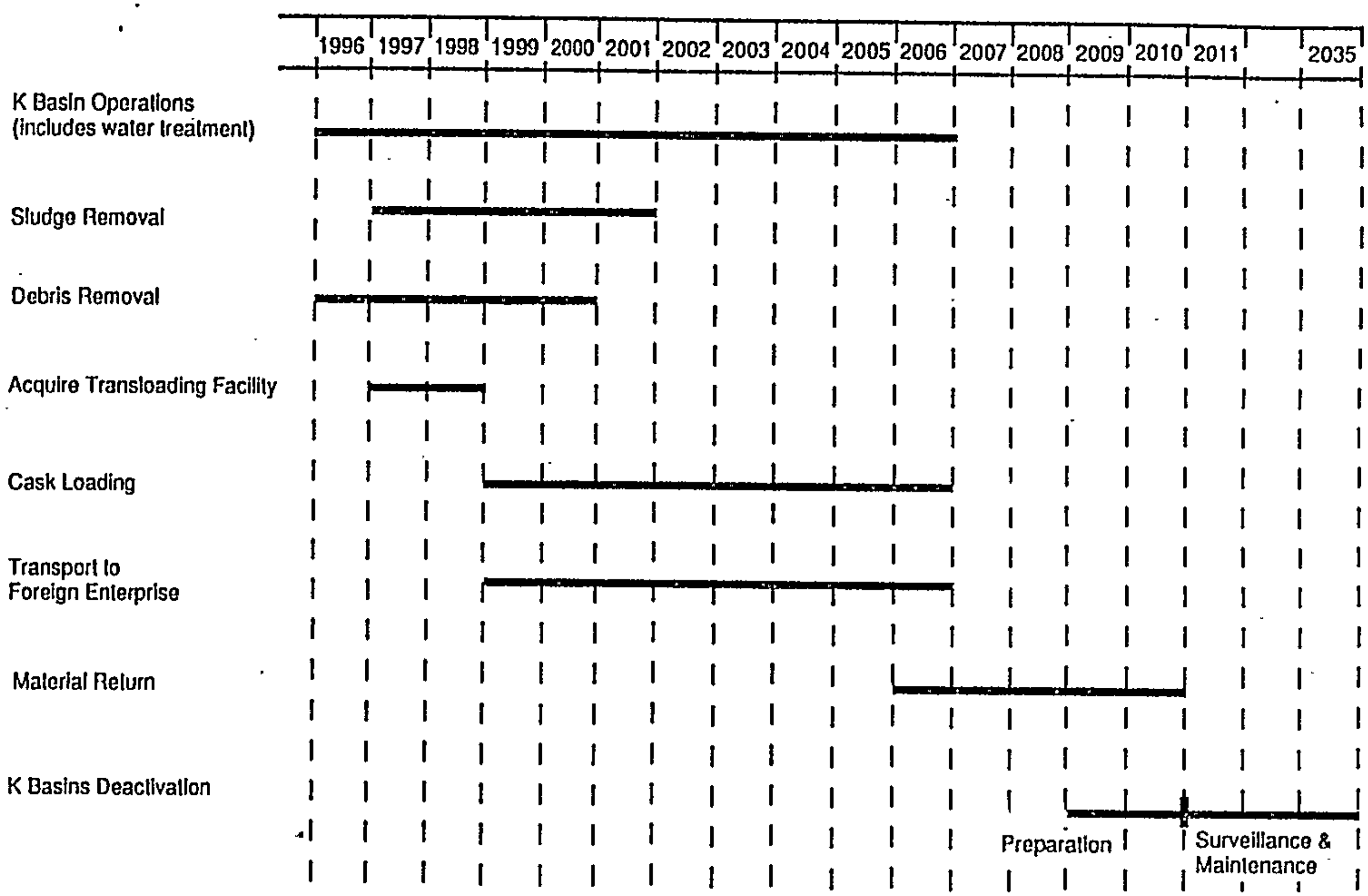

Figure 3-11. Summary schedule for the foreign processing alternative (Bergsman et al. 1995)

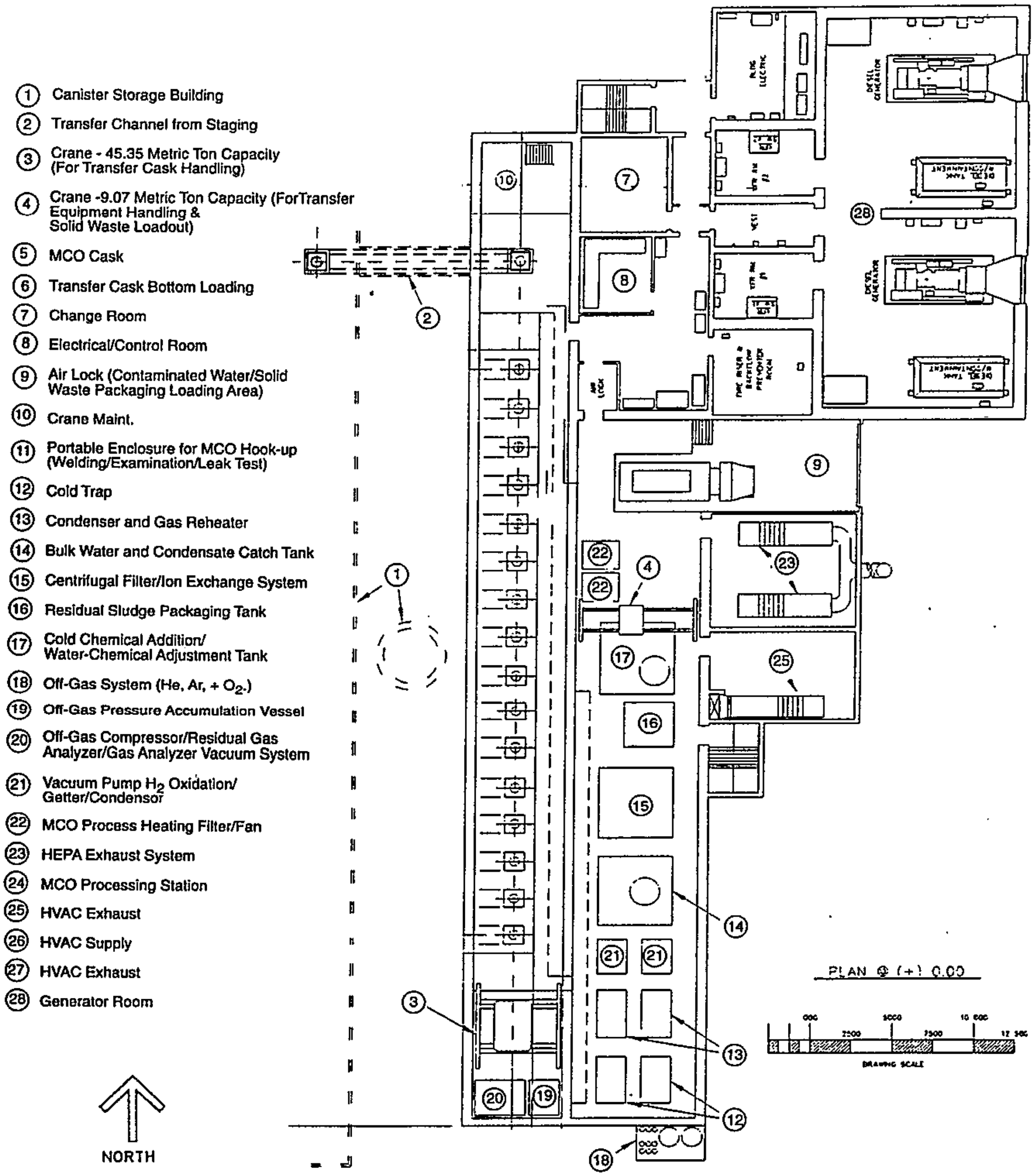

Figure A-8. Proposed conditioning facility conceptual layout (Bergsman et al. 1995)

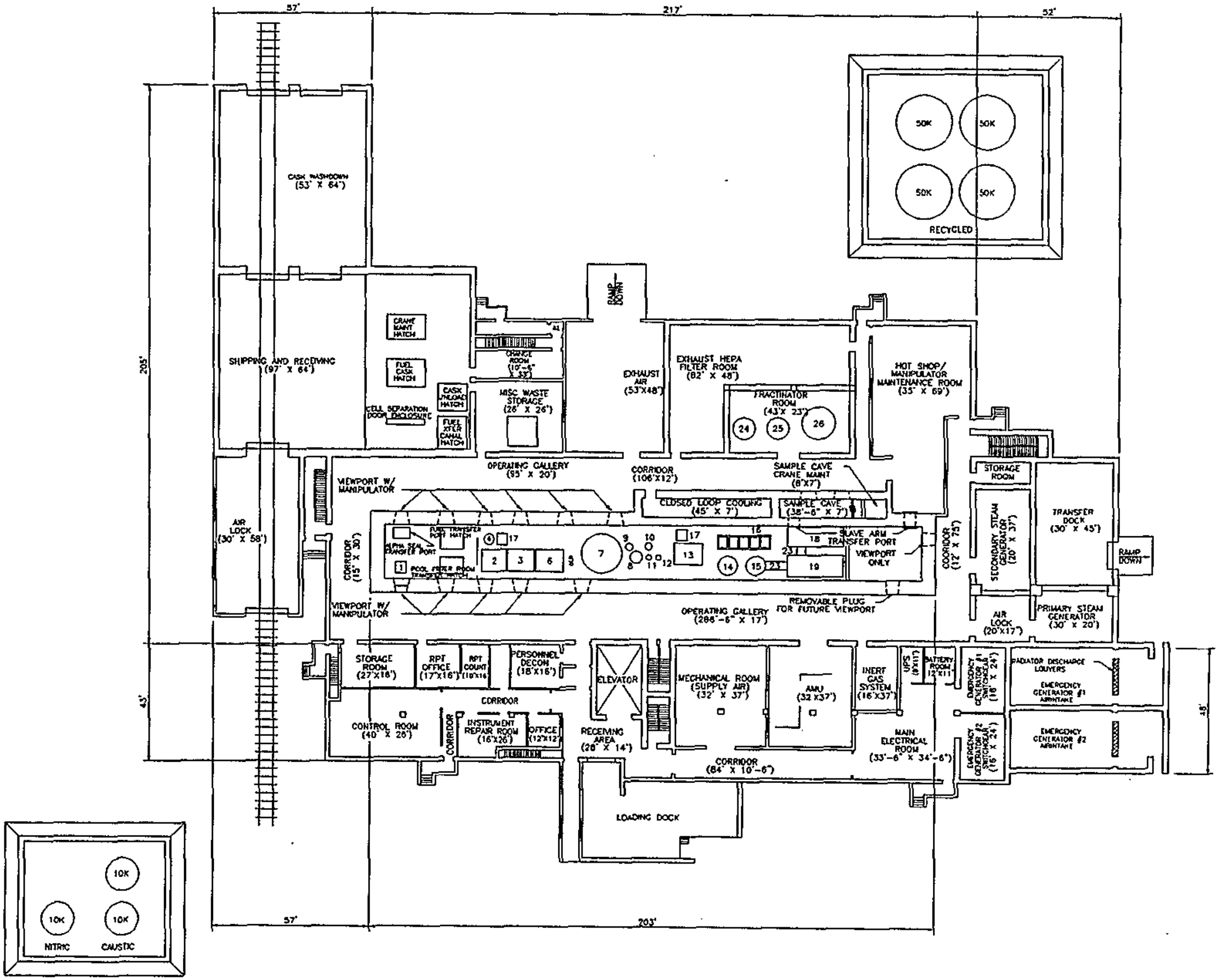

Figure A-9. Proposed calcination facility (Bergsman et al. 1995)

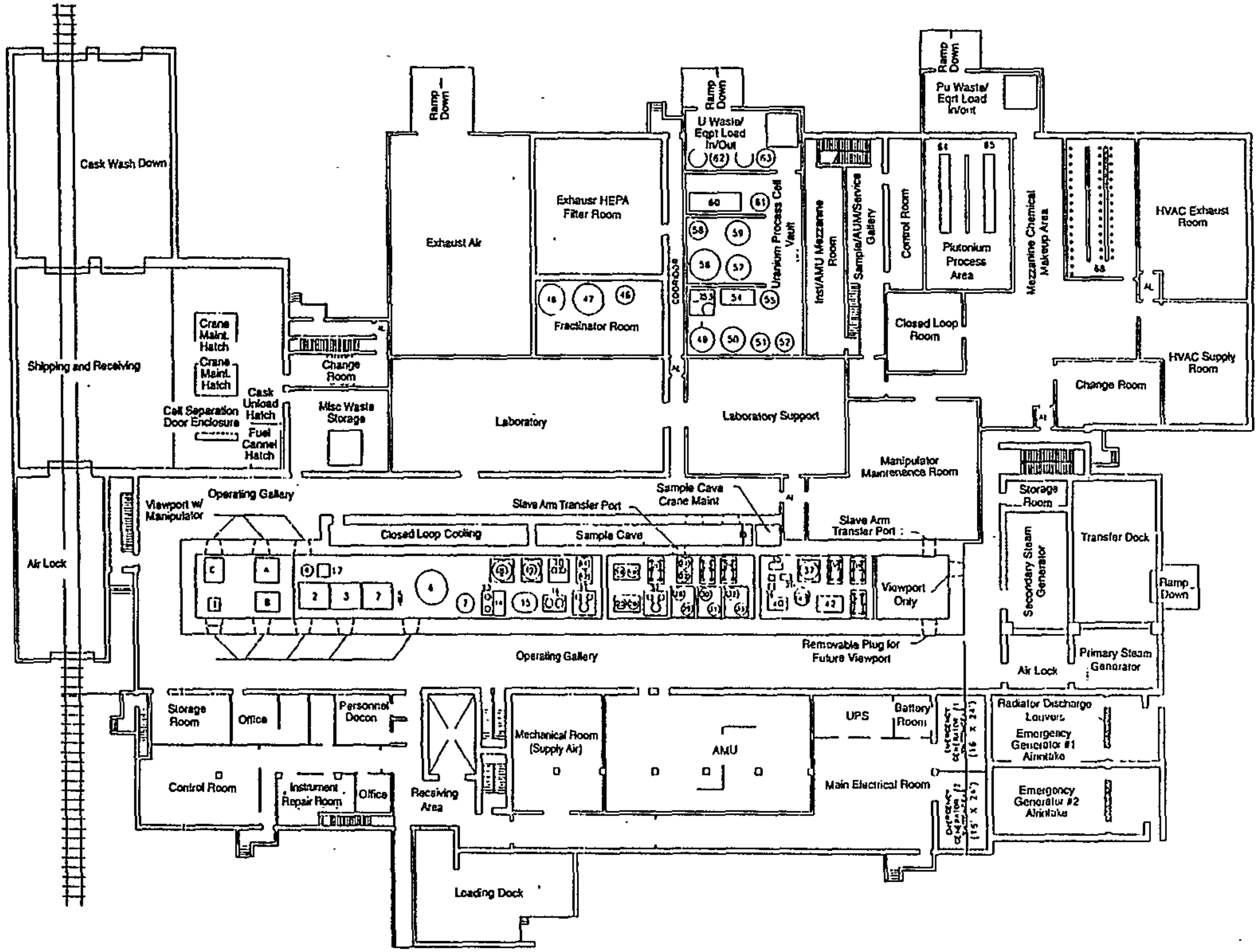

Figure A-11. Proposed onsite processing facility

4.0 REFERENCES

DOE (U.S. Department of Energy). 1995a. *Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement*. DOE/EIS-0203-F, U.S. Department of Energy, Washington, D.C.

DOE (U.S. Department of Energy). 1995b. *Management of Spent Nuclear Fuel from the K Basins at the Hanford Site, Richland, Washington*. DOE/EIS-0245D, U.S. Department of Energy, Richland, Washington.

WHC (Westinghouse Hanford Company). 1995. *Operations Safety Requirements, 100K East and 100K West Fuel Storage Basins*. WHC-SD-WM-OSR-006, Rev. 0C. Westinghouse Hanford Company, Richland, Washington.

5.0 PUBLIC READING ROOMS AND INFORMATION REPOSITORIES

DOE Freedom of Information Reading Room
U.S. Department of Energy
Forrestal Building
1000 Independence Ave., S.W.
Washington, D.C. 20585
(202) 586-3142

Gonzaga University
Foley Center Library
E. 502 Boone
Spokane, WA 99258
(509) 328-4220 Ext. 3132

University of Washington
Suzzallo Library, FM-25
Government Publications Room
Seattle, WA 98195
(206) 543-1937

Portland State University
Branford Price Millar Library
Government Documents Section
924 Southwest Harrison
Portland, OR 97207
(503) 725-3690

DOE Public Reading Room
Washington State University
100 Sprout Road
Richland, WA 99352
(509) 376-8583

Richland Public Library
955 Northgate
Richland, WA 99352
(509) 943-7457

APPENDIX A

LETTERS AND TRANSCRIPT

December 4, 1996

Dr. Philllip G Loscoe
K-Basins Draft EIS Comments
U.S. Department of Energy
P.O. Box 550
Richland, WA, 99352

Dr. Loscoe:

Regarding storage of spent nuclear fuel, please analyze careful. This is a sophisticated engineering project and hopefully the trend toward nuclear storage wastes will be over.

My feeling is that the existing containers are very fragile and one mistake will cause a nonrecoverable loss of a river as well as potentially our lives and children. Please don't shortcut the operation. It must be safe and intelligent.

Thanks Marceen Bloom
755 S. W. Maplecrest Drive
Portland, Oregon
97219

RECEIVED DOE-RL

DEC 1 5 1995

AMW

L02

Curt Leslie
Box 698
Wallula, WA 99363
509/547-5807
December 13, 1995

Dr. Phillip G. Loscoe S7-41
K-Basins Draft EIS Comments
U S Department of Energy
P O Box 550
Richland, WA 99352

Dear Dr. Loscoe:

The speaker at the Tuesday afternoon public hearing expressed an oppinion of the process of working through to a Record of Decision before proceeding with work on the Hanford site.

I think that the procedures are of value and do contribute to a quality of work that makes their extra cost in time and money worthwhile.

Certainly lay people will rarely come up with ideas that surpass those of the professionals in charge of any project. But, as you so aptly and accurately pointed out, no project is free standing, the process of decision affects many other future decisions.

And, any decision also affects the community in more than just technical and/or engineering fa ctors. The Hanford site of all government facilities has for too long been a mystery, it s people not really part of Southeastern Washington or the Pacific Northwest.

It is unfortunate that more people do not take the time or make the effort to take advantage of the informal exchange of ideas as well as the formal comment period.

One possibility not discussed as any possibility regarding the SNF in the K-Basins is the 200 North Area. This was a five or so track siding area together with a series of cooling ponds built to the North and slightly East of 200 West and never used. If these are still serviceable, the SNF in question could be interim stored there, and over and above public uproar, commercial fuel could be stored awaiting its final disposition, at very little additional cost or risk.

Best regards -

Curt Leslie

A.2

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Dr. Philip G Loscoe 57-41
K-Basins Draft EIS Comments
US DOE
PO Box 550
Richland, WA 99352

Dear Dr. Loscoe,

I only have to say please be wise in your determination of how to proceed with the storage of this near immortal stuff we've created. Don't be swayed off the correct path.

Sincerely,

[signature]

Craig Saxon DC
2121 177th Ave. NE
Snohomish, WA 98290

Wish I could make Pasco.

Dear Mr. Loscoe,

I'm not aware what is out at Hanford's K Basins. I live close enough though in Yakima to where I'm interested in knowing just what is.

I read somewhere that all spent fuels in tanks in liquid forms would be converted into a non-radioactive placement by a process called in situ vitrification. Do I have this term right? Some form of heating and/or electrification that would reduce... etc, etc? Maybe you could educate myself on this. I also was informed that France had mastered this feat three years from the time Hanford got ahold of such information—knowledge. Is in situ vitrification a option at this time and place?

Yours, Mr. Struiksma

Nez Perce

ENVIRONMENTAL RESTORATION & WASTE MANAGEMENT

P.O. BOX 365 · LAPWAI, IDAHO 83540-0365 · (208) 843-7375 / FAX: 843-7378

December 15, 1995

Dr. P. G. Loscoe
U.S. Department of Energy, Richland Operations Office
P.O. Box 550, MS S7-41
Richland, Washington 99352

Dear Dr. Loscoe:

The Nez Perce Tribe Department of Environmental Restoration and Waste Management (ERWM) has received and reviewed a copy of **Draft Environmental Impact Statement, Management of Spent Nuclear Fuel from the K Basins at the Hanford Site, Richland, Washington, October 1995; DOE/EIS-0245D; U.S. Department of Energy, Richland, Washington 99352** (The EIS). The Nez Perce ERWM has provided comments, included with this letter.

Since 1855 Nez Perce Tribe treaty rights in the Mid-Columbia have been recognized and affirmed through a series of Federal and State actions. These actions protect Nez Perce interests to utilize their usual and accustomed resources in the Hanford Reach of the Columbia River and elsewhere. Accordingly, the Nez Perce Tribe ERWM has U.S. Department of Energy (DOE) support to participate in and monitor relevant DOE activities. The Nez Perce Tribe ERWM program responds to documents calling for comments from DOE.

The Nez Perce Tribe favors protection of the Columbia River and its ecosystem through removal of spent nuclear fuel from the K-Basins. The Tribe believes groundwater and the Columbia River are at risk from potential radionuclide or toxic chemical releases from the K-Basins in event of an earthquake or other accident at the K-Basins. The Nez Perce Tribe endorses the preferred alternative of removal and transport with drying/passivation and dry vault storage. However, we have some comments and questions that may facilitate improvement of the plan. Hereunder are our general statements regarding the EIS:

* The Nez Perce Tribe endorses the Tri-Party Agreement Consent Order requiring K-Basins Spent Nuclear Fuel (SNF) removal as quickly as possible or by December 31, 2002.

* The 40 year storage period analyzed in the EIS does not preclude longer term interim storage if necessary. The Nez Perce Tribe is against long term storage of SNF at Hanford.

* The EIS does not adequately explain why removed K-Basin contaminated water needs to be replaced with clean water following SNF removal.

RL COMMITMENT CONTROL

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RICHLAND OPERATIONS OFFICE

* When the first fuel rods are removed it seems likely that clouding of K-Basin water will occur from sludge on the basin floor. We question the ability to remove fuel rods safely in clouded water.

* A stated disadvantages of the preferred alternative is uncertainty regarding the chemical state and pyrophoric nature of the SNF. It is of concern that no EIS text explanation is given of how the pyrophoric state of the SNF will be monitored.

* The Tribe does not favor the construction of a wet storage facility since a below surface radioactive water impoundment would be created. Such an impoundment creates another possibility for contaminated water to impact the soil. groundwater and possibly the Columbia River.

* An option is considered where all vacuum drying could be completed at one location. The preferred alternative endorses vacuum drying/conditioning at two locations. The EIS text did not explain why two stage drying is preferred.

* The EIS states dry storage SNF temperatures would not need to be low because of reduced potential for continued corrosion. The Tribe suggests any corrosion in a sealed multicansiter overpack (MCO) is too much as it could cause pressurization and possible rupture of the MCO.

* Several chemicals including, sulfuric acid, Polychlorinated biphenyl's (PCB's), sodium hydroxide. Alum, chlorine and polycrylamide are mentioned as present at the K-Basins. Copper is also listed as a resource consumption at the proposed passivition facility. To aid our understanding, we would like to know the use of these chemicals at the K-Basins.

* Long term storage of SNF at the K-Basins is not favorable partly because of the possibility of seismic hazards. A seismic event could crack the K-Basins and cause leakage of water impacted with radioactive materials. The Tribe considers K-Basin seismic monitoring to be a necessity.

* The EIS states, at the proposed SNF management facility, sagebrush steppe habitat would be lost until the facility is decommissioned and the site returned to natural state. Does "returned to its natural state" mean the site will be revegetated?

* Surveys regarding cultural resources and habitat mitigation were referenced as having been completed for the EIS. The Tribe would like to be contacted and offered the option of being present on future surveys to help evaluate these parameters with respect to Native American usage.

* It states an additional 0.3 Metric tons of weapons grade uranium will be going to the K-Basins from the Plutonium and Uranium Recovery through Extraction (PUREX) Plant. Continued shipment of uranium to the K-Basins is not supported by the Tribe.

* The EIS states during any power outage all K-Basins fuel handling activities will cease. We consider it very important to condition, filter, monitor and cool the water associated with fuel storage. How can the site be safe when a condition such as this exists? Is there emergency backup lighting avaliable for workers to exit the building?

The Nez Perce Tribe ERWM office appreciates the opportunity to provide comment on **Draft Environmental Impact Statement, Management of Spent Nuclear Fuel from the K-Basins at the Hanford Site, Richland, Washington, October 1995; DOE/EIS-0245D; U.S. Department of Energy, Richland, Washington 99352**

If you wish to discuss Nez Perce ERWM's comments further please contact Paul Danielson of ERWM's technical staff at (208) 843-7375.

Respectfully submitted.

Donna L. Powaukee
ERWM Manager

In Concurrence: ______________________
Samuel N. Penney, Chairman for
Nez Perce Tribal Executive Committee

cc: John Wagoner, DOE-RL, Site Manager
Kevin Clarke, DOE-RL, Indian Programs Manager
Steve Alexander, Ecology, Perimeter Areas Section Manager
Douglas Sherwood, EPA, Hanford Project Manager
Russell Jim, YIN, ER/WM Manager
J.R. Wilkinson, CTIUR, SSRP Manager

RESPONSE TO

DRAFT ENVIRONMENTAL IMPACT STATEMENT, MANAGEMENT OF SPENT NUCLEAR FUEL FROM THE K-BASINS AT THE HANFORD SITE, RICHLAND, WASHINGTON, OCTOBER 1995; DOE/EIS-0245D; U.S. DEPARTMENT OF ENERGY, RICHLAND, WASHINGTON 99352

Comments Prepared By:

Nez Perce Tribe
Department of Environmental Restoration and Waste Management Staff

December 15, 1995

THE NEZ PERCE TRIBE
ENVIRONMENTAL RESTORATION & WASTE MANAGEMENT DEPARTMENT

COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT, MANAGEMENT OF SPENT NUCLEAR FUEL FROM THE K BASINS AT THE HANFORD SITE, RICHLAND, WASHINGTON, OCTOBER 1995; DOE/EIS-0245D; U.S. DEPARTMENT OF ENERGY, RICHLAND, WASHINGTON 99352

Since 1855 Nez Perce Tribe treaty rights in the Mid-Columbia have been recognized and affirmed through a series of federal and state actions. These actions protect the interests of the Nez Perce to utilize their usual and accustomed resources and resources areas in the Hanford Reach of the Columbia River and elsewhere. Accordingly, the Nez Perce Tribe Department of Environmental Restoration and Waste Management (ERWM) has DOE support to participate in and monitor certain DOE activities. The Nez Perce Tribe ERWM responds to documents calling for public comment from DOE. The program critically reviews and comments on documents in an objective and straight forward manner. Each document review is provided in a format that lists the Page number, Column number and Paragraph number: Comment. Following are specific comments on the **Draft Environmental Impact Statement, Management of Spent Nuclear Fuel from the K Basins at the Hanford Site, Richland, Washington, October 1995; DOE/EIS-0245D; U.S. Department of Energy, Richland, Washington 99352**

SPECIFIC COMMENTS:

Page 1.4, Paragraph 3
The Nez Perce Tribe endorses the Tri-Party Agreement Consent Order requiring removal of Spent Nuclear Fuel (SNF) from the K-Basins as quickly as possible or by December 31, 2002. The short distance of contaminated K-Basin water from the Columbia River suggests the possibility of impact to the River. Removal of the SNF from that location is considered necessary by the Tribe.

Page 1.5, Paragraph 1.3
Some of the information that would ordinarily be presented in this EIS is incorporated by reference. For our convenience, we would prefer the reference information be submitted with the Document rather than referenced from another document.

Page 1.8, Paragraph 3
The 40 year storage period analyzed in this EIS does not preclude longer term interim storage. We are against long term storage of SNF at Hanford because a repository is a much safer place.

Page 3.12, Paragraph 7
Sludge in the base of the K-Basins consists partly of fine grained materials that are easily suspendable when disturbed. After the first fuel rods are removed from the site, how will the remaining work be completed safely in cloudy water?

Page 3.3, Ninth Bullet
The EIS does not explain why contaminated water in the K-Basins needs to be replaced with clean water following SNF removal. The Tribe is against storing anything in the K-Basins. including water, that could potentially mobilize displaced contaminants to the groundwater or Columbia River should a seismic event or accident occur. Please explain why replacing K-Basin water with clean water is proposed.

Page 3.4, Paragraph 2
A stated disadvantage of the preferred alternative is uncertainty regarding the chemical state and pyrophoric nature of the SNF. No explanation is given of how the pyrophoric state of the SNF will be monitored reducing the possibility of fire or reaction. Please explain how you propose to accomplish this monitoring.

Page 3.16, Fourth Bullet
We concur with the EIS not making wet storage the preferred alternative since a below surface radioactive water impoundment would be created. Such an impoundment would create another opportunity for contaminated water to impact the soil, groundwater and possibly the Columbia River.

Page 3.26, Fourth Paragraph
An option considered is vacuum drying at one location. The preferred alternative endorses vacuum drying/conditioning at two locations. The EIS did not explain why two stage drying was preferred. Unless a good engineering reason exists why two stage conditioning/drying is necessary, the one step option seems favorable to reduce expense. Please explain your chosen alternative.

Page 3.27, Second Bullet
It states dry storage SNF temperatures would not need to be as low as another option because significantly lower potential for continued corrosion exists. We suggest any corrosion in a sealed multicansiter overpack (MCO) is too much, as it could cause pressurization and possible rupture of the MCO. Please clarify if continued corrosion is possible in sealed. dry storage MCO's.

Page 3.38, Paragraph 4 & 5
It states 2,800 tons of uranium trioxide and 5 tons of plutonium dioxide would be produced from processing K-Basin fuel in the onsite processing alternative. On page 1.1 it states only 2,315 tons of SNF are currently stored in the K-Basins. Is the extra weight from the oxygen in the produced oxidized product? Is the extra weight fuel from another location or has a mistake been made in calculation? Please explain.

Page 3.49, Table
Alum and Chlorine are mentioned and usage quantities are given for each alternative. The reason for usage of these materials is not mentioned in the EIS text. The information on chemical usage would be valuable to us in assessing this and future Hanford related documents.

Page 3.52, Paragraph 2
The EIS does not indicate an income range from uranium and plutonium oxide product sales in the processing alternatives. This information would be valuable to us.

Page 4.1, Paragraph 2
The text indicates shrub steppe is inhabited by large sagebrush. The correct common name is big sagebrush.

Page 4.14, Seismic Hazards
Long term storage of SNF at the K-Basins is not favorable partly because of the possibility of seismic hazards. A seismic event from a location such as the Coyote Rapids seismic swarm could crack the K-Basins and cause leakage of water impacted with radioactive materials into the surface aquifer and possibly the Columbia River. The Tribe favors continious seismic monitoring at the Hanford site to mitigate this risk.

Page 5.12, Paragraph 1
It states, at the proposed Canister Storage Building (CSB) Site, direct or indirect impacts to traditional properties are not anticipated. It is the opinion of some Tribal groups, the bulk of the Hanford Site should be listed as a cultural resource site. As a minimum, we request sagebrush steppe improvement at another location to mitigate lost CSB habitat, should construction occur there.

Page 5.70, Table
Resource consumption for copper at a passivation facility is shown. What is the use of copper in a proposed passivation facility?

Page 5.109, Paragraph 4
Several chemicals including, sulfuric acid, Polychlorinated biphenyl's (PCB's), sodium hydroxide, chlorine and polycrylamide are mentioned as present at the K-Basins. To aid our understanding, we would like to know the use of these chemicals at the K-Basins?

Page 5.119, Paragraph 4
It states, at the proposed SNF management facility, sagebrush steppe habitat would be lost until the facility is decommissioned and the site returned to its natural state. Does "returned to its natural state" mean the site will be revegetated? The Tribe requests, upon decommissioning, revegetation with natural vegetation.

Page 5.122, Table
In the last column of the Table, lifecycle costs for various alternatives are given. What drives variation in cost for the passivation/dry storage alternative?

Page 5.123, Paragraph 3
It states, cultural resource surveys have been completed in the area of interest and no cultural resources that might preclude construction were noted at either of the new proposed facility sites. The Tribe favors cultural resource surveys. Please reference the specific surveys completed for these proposed facilities. We request, when future cultural resource surveys are conducted, we be contacted and offered the option of participating.

Page 5.124, Paragraph 2 & 3
The Tribe applauds the idea of habitat replacement mitigation at Hanford. We ask to be contacted and offered the option of input on proposed mitigation options when they occur.

Page 6.9, Paragraphs 3 - 6
The Tribe favors policies protecting Indian government, religion, culture and archaeology. We interpret these policies to mean we should be contacted and allowed input into research and fieldwork to produce conclusions stated in this and other documents.

The area of protection of Native American culture are quite broad in these policies. We support inclusion of Native American cultural use plants protection policies as well.

Page A.1, Paragraph 4
It states, an additional 0.3 Metric tons of weapons grade uranium will be going to the K-Basins from the Plutonium and Uranium Recovery through Extraction (PUREX) Plant. We realize comments have already been received on this subject. We do not support continued shipment of uranium to the K-Basins. Also, the document does not specify K-East or K-West as receiving shipments.

Page A.11, Paragraph 2
It states, during power outage, all K-Basins fuel handling activities will cease, since normal instrumentation will be lost. It is surprising backup power does not supply the site. We consider it very important to condition, filter, monitor and cool water associated with fuel storage. Is emergency lighting avaliable for employees to exit in an emergency? How can the site be safe when this condition exists?

Page A.21, Figure A-9
Locations within Figure A-9 are numbered, however, the numbers are not explained in a legend. For purposes of understanding, it is helpful to have a legend.

Page A.24, Figure A-11
We would like to know locations of positions 24, 26 and 27 not shown on the Figure. Also, what is the purpose of a cold trap as shown at position 12? Information like this is important in evaluation of K-Basin alternatives.

L06

Oregon

DEPARTMENT OF ENERGY

December 29, 1995

Dr. P. G. Loscoe
U.S. Department of Energy
Richland Operations Office
P.O. Box 550, MS S7-41
Richland, WA 99352-0550

Dear Dr. Loscoe:

We have reviewed the "Draft Environmental Impact Statement, Management of Spent Nuclear Fuel from the K-Basins at the Hanford Site, Richland, Washington" (DOE/EIS-0245D), dated October, 1995.

We agree with both the need and scope of this Environmental Impact Statement (EIS). We support the proposed solution. Removal of the fuel stored at the K-Basins is a high priority issue for Oregon. Both the Oregon Department of Energy and the Oregon Hanford Waste Board have publicly stated their support. We have actively promoted the early resolution of the problems at the basins since 1993.

The EIS has flaws and omissions. These need to be corrected. However, they must not slow the work to remove and stabilize the fuel in the basins.

The highly damaged corroding fuel at the K-Basins, the sludges in the basins, and the leaks from the basin present sizeable risks to the citizens of the Northwest. The fuel in the basins presents a large catastrophic risk from an earthquake followed by drainage of the pools and a fuel fire. It is important USDOE analyze and disclose the magnitude of this risk. Hanford emergency drills should include this scenario and as well as those identified in the EIS.

The chemical condition of the fuel is not well known. Significant amounts of uranium hydride may have formed, especially in the sealed storage of the K-West Basin. It is essential for the success of the fuel relocation effort that more data on the chemical and pyrophoric character of the fuels be determined. USDOE should consider all of the information available about the potential for a fire involving the fuels, including information which may exist in classified records, and

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information received from British Nuclear Fuels about there experiences with similar fuels igniting after exposure to air.

Transport and stabilization of these fuels on site adds several new risks. The incident scenarios used may not adequately represent the actual risks posed by the fuel in the basins or during transport and that the exposure estimates for the incident scenarios presented may be low. Estimating the potential risks from a pyrophoric metal fire is very difficult.

The corroded fuel is not stable. Jostling during transport may lead to overpressurization of the containers as hydrogen and noble gases are released from the fuel. Overpressurization may cause releases of radioactive materials to the environment. These conditions will only get worse as the fuel continues to corrode in the basins. The no action and enhanced storage alternatives will not resolve them and will not protect human health or the environment.

These are significant risks, and appropriate planning must also occur to prevent their occurance, to minimize their impacts and to prepare for any potential accidents.

Transport of the fuels off the Hanford site should not be considered. The fuel condition is too poorly known and understood to provide a basis for a meaningful assessment of the risks. An accident involving severely damaged corroding pyrophoric radioactive spent fuel could have very severe consequences.

We disagree with the proposal to dispose of the sludges from the K-East basin to the tank farms. This will not resolve the problems posed by this material. It will only postpones resolution to some unidentified future date. It may greatly complicate the terribly difficult problems in the tanks. And, it may add new risks to the tanks and complicate the already excessively complicated chemistry and control problems in the tank farms. It is our view that disposing of large quantities of mildly water reactive, potentially pyrophoric, reactive metal and abrasive solid sludge containing large quantities of uranium and plutonium is imprudent. Doing so may severely impact the operations in the tank farms. It may damage pumps, piping and other facilities, impact vitrification of the waste and increase the long term risk to health and the environment from the residuals left in the tanks.

Additionally, recent testing has found PCBs in the sludge. The tank farms and the water disposal facilities are not permitted to accept PCB containing wastes. This alone should prohibit consideration of disposal of these wastes to tank farms. These sludges are most similar in character and composition to the fuel in the basins. They should be treated in a similar manner for ultimate disposal.

The EIS mentions possible value to recovery and reuse of the uranium and plutonium at some future date as nuclear fuel. The nation has no current or foreseeable need for this material. It should be declared excess and plans for its ultimate disposal should begin.

The EIS omits analysis of the potential impacts to the environment from accidents resulting in releases of radioactive materials. The EIS states a very high risk these events occurring. The shrub-steppe habitat at Hanford is priority habitat. It is home to a large number of species which are either listed or under consideration for listing as rare, threatened or endangered by the State or Federal government. Protection of these species and the habitat they live in is a high priority. Analysis of the potential impacts will better allow for appropriate planning to prevent such harm.

Also, if the selected action or accidents during its performance result in habitat impacts, offsetting remediation and replacement of this habitat will be necessary. Plans for this should be coordinated with the Hanford Natural Resource Trustee Council.

Our detailed comments on the EIS are attached. If you have any questions in regard to these comments, please call me at (503)378-3187.

Sincerely,

Dirk Dunning
Oregon Department of Energy

Oregon Department of Energy
Detailed comments on the
Draft Environmental Impact Statement for
Management of Spent Nuclear Fuel from the K Basins
at the Hanford Site, Richland, Washington.
December 29, 1995

1. Summary, page iv, last two sentences. The Environmental Impact Statement (EIS) should detail the mitigation measures which will be taken. The measures should be selected in consultation and coordination with the Hanford Natural Resource Trustee Council.

2. Summary, page vii, second paragraph, last line states "Some actions at the K-Basins will be coordinated with other cleanup activities in the 100-K Area." These should be identified in the EIS.

3. Summary, page vii, third paragraph. It should also be noted that the Dose Reconstruction for Hanford is not complete. Based on an population lifetime incremental cancer risk slope factor of 6×10^{-4} per rem of radiation exposure, the 100,000 person-rem of exposure corresponds to approximately 60 additional direct cancer fatalities as a direct result of Hanford operations.

4. Summary. page vii, last sentence, and Section 5.9. Though the impacts of additional habitat destruction from selection of the undisturbed site may be small for this EIS, the cumulative impacts of habitat destruction from all of the EISs and actions planned, or considered at Hanford is very large. The habitat in this area of the Hanford site is already of questionable size to support the Sage Grouse and other sensitive species. Any additional impacts should be avoided if at all possible. These impacts may also contribute to limiting the possible solution to other problems on the site.

5. Summary, page viii, second paragraph. The appropriate standard for comparison of the cancer risks posed by the activities proposed in the EIS is not the background natural radiation exposure. The natural background (page vii, third paragraph) based on the authors data presents an additional 1.8×10^{-4} Lifetime Fatal Incremental Cancer risk per year. Based on a fifty year exposure period, this corresponds to an additional direct Lifetime Fatal Incremental Cancer risk of 1.8 percent.

   The Superfund cleanup criteria for hazardous constituents is based on a Lifetime Fatal Incremental Cancer Risk range from 1×10^{-6} on the low end to 1×10^{-4} on the high end. A 1.8 percent cancer risk corresponds to 180 times the upper end of the Superfund cleanup criteria. This is a more appropriate basis for risk comparison.

6. Summary, page viii, last paragraph. Any additional wastes added to the Double Shell Tanks compete directly for available space with wastes from the Single Shell Tanks. The SSTs are in continuous non-compliance with State and Federal law. Reprocessing of the waste fuel would complicate resolution of the tank problems. Additionally, it would violate Federal policy prohibiting reprocessing. This has potentially severe impacts on international agreements on disarmament and non-proliferation.

7. Summary, page ix. As we previously noted in comments on the proposed cleanout of the PUREX facility nitric acid, use and destruction of nitric acid does not necessitate the release of large quantities of nitrogen oxides to the atmosphere. The semiconductor industry is now converting many of its wet chemical nitric acid oxidation processes to include an additional oxidant (hydrogen peroxide) to inhibit the formation of nitrogen oxides during silicon and metal dissolution.

   The U.S. Department of Energy (USDOE) used a sugar denitration process at the PUREX and similar facilities to destroy nitric acid. This generated immense quantities of nitrogen oxides as waste off gas. USDOE previously demonstrated that nitric acid can be safely and effectively destroyed without generating significant quantities of nitrogen oxides by mixing it under controlled conditions with formic acid.

8. Introduction, page 1.1, first paragraph, last line. This may mislead the reader as to the extent of the fuel corrosion. Though fuel is only stored in open canisters in the K-East Basin, and hence has only released fuel and fission products into the water in significant quantities in this Basin, there is no reason to expect the fuel in K-West Basin to be in much better shape. A large percentage of the fuel in both Basins is highly damaged and corroding. Also, due to the exclusion of additional oxygen in the containers in K-West, there is a strong possibility that a great deal more uranium hydride has formed in the fuel stored there.

9. Introduction, page 1.1, second paragraph, third line. This sentence is misleading. Though there is an asphaltic liner under both basins, the liner does not extend under the entire bottom of either basin. The liner does not

extend under the construction seam between the basins and the K-105 reactor buildings. This construction joint is a weak point in the basins. The design allowed a several hundred gallon per day leakage from this joint into the soil and deemed this level of leakage acceptable.

10. Description of Alternatives, page 3.1, no action alternative, last paragraph. (See also section 3.2.1) Though the design life of the basin is a great concern for many reasons, seismic risks, followed by drainage of the pool and possible fire, poses a much larger risk and is an even larger reason to move the fuel. The risks of large earthquakes at Hanford is small, but not zero. In a sizeable earthquake, the basins and the reactor buildings can be expected to behave as independent structures. This may result in the opening of the construction seam and drainage of the water in the basins.

    USDOE recently upgraded the basins to reduce this risk by adding steel doors to the basin. This reduced, but did not eliminate the seismic risks. The basin design do not anticipate the potential of earthquakes as large as may occur on the site.

    British Nuclear Fuels reported to USDOE that there is a sizeable risk that fuels of the type stored in the basins may spontaneously ignite after exposure to air. (See page 1.8, last paragraph, sixth sentence.) This presents a huge and unacceptable risk to the citizens of the Northwest and is the major reason for proceeding with stabilization and removal of the fuel from the basins. The EIS should clearly show the potential magnitude of such an event. This information should also be forwarded to all other USDOE facilities storing similar materials. (See the USDOE Spent Fuel Working Group Report, Volume 1, November 1993.)

11. Description of Alternatives, page 3.2, enhanced K Basins storage alternative. (See also section 3.2.2) This has all of the disadvantages of the no action alternative and should be similarly modified in regard to the seismic disaster risk. Also, the basins provide no means for controlling radionuclide emissions to the air. This should be noted for both this and the no action alternatives.

12. Description of Alternatives, page 3.2, new wet storage alternative, last paragraph. (See also section 3.2.3) Contrary to this paragraph, the EIS provides no reason to believe that new wet storage would reduce the

continuing deterioration of the fuel. It may confine most of it to canisters, but these will have to be vented to allow for release of hydrogen and noble gases from the on-going corrosion of the fuel. Also, movement of the fuel will likely cause a large one time degradation of the fuel due to jostling, which may break up some fuel and corrosion products, thereby exposing additional fuel to corrosion.

13. Description of Alternatives, page 3.3, drying/passivation (conditioning) with dry storage alternative, seventh bullet. (See also section 3.2.4) The Hanford tanks already contain some of the most complex and difficult wastes imaginable. The addition of any new wastes to these tanks will only compound the problems in removing and handling these wastes. It is unacceptable to consider adding a water reactive, pyrophoric, hydrogen generating solid to this witches brew.

    Recent testing has demonstrated the presence of Polychlorinated Biphenyls (PCBs) in the sludge. This is not surprising. PCBs were believed to be safe and were used indiscriminantly by industry in the past. The Hanford radioactive wastes were often viewed as so terrible that additional hazards could not significantly increase the problem. Neither the tank farms or the water disposal facilities are permitted to accept PCBs.

    If the sludge is to be consolidated with other wastes, it is most similar in characteristic to the fuel in the basins, and should be dried, stabilized, packaged and stored with the corroded spent fuel for final disposition.

14. Description of Alternatives, page 3.3, drying/passivation (conditioning) with dry storage alternative, eighth bullet. (See also section 3.2.4) The debris in the basin is likely sufficiently contaminated with plutonium and other actinides that it may be properly classified as Transuranic waste (TRU). Because it is the result of a slow water reprocessing of the fuel and includes pieces of fuel, it may also be High Level Waste. (See Title 42 U.S. Code, Chapter 108, Section 10101(12)) Also, if it is contaminated with PCBs, additional disposal restrictions (mixed waste) may apply.

15. Description of Alternatives, drying/passivation (conditioning) with dry storage alternative, page 3.4, first paragraph, last sentence. (See also section 3.2.4) The drying and passivation of the fuel may reduce the hydrides in the fuel, but it is highly unlikely that it will eliminate them.

Initial analytical data on the fuel reports a sizeable quantity of hydrogen in the fuel.

16. Description of Alternatives, page 3.4, calcination with dry storage. (See also section 3.2.5) Calcination will release a sizeable fraction of the fission products in the fuel. The EIS should state this, estimate the amount of material expected to be released, explain how these will be treated, captured or contained, and what their ultimate disposition will be.

17. Description of Alternatives, page 3.4, onsite processing, second paragraph. (See also section 3.2.6) As a nation, we are awash in plutonium and uranium. There is no economic value to be gained from separating this material. Contrary to the statement in the last line, the wastes produced will not be in a form suitable for storage in a geologic repository. The processing of the tank wastes into a more stable form is not guaranteed. Any additional wastes generated and sent to the tank farms will add to the burden already present in the tank farms and further jeopardize the removal of the waste from the non-compliant Single Shell Tanks.

    Further, page 3.5 lists the disadvantages and omits the radioactive emissions which would occur from such a facility. It also omits that no facility exists at Hanford which could perform this operation. This would necessitate the construction of a new reprocessing facility with a very limited mission at exorbitant cost. This in turn raises issues over non-proliferation and dismantlement. It would violate U.S. policy not to reprocess fuel.

18. Description of Alternatives, page 3.5, foreign processing. (See also sections 3.2.7 and 6.1) This option also omits the discussion of impacts on non-proliferation treaties. The transportation of this highly degraded pyrophoric fuel would present very large and undefinable risks. The potential disaster hazard from an accident involving this material is unacceptably large. Whatever is done to stabilize the fuel must occur at Hanford.

19. Description of Alternatives, page 3.5, discussion after alternatives, first paragraph. As noted previously, shipment of the sludges to tank farms unacceptably impacts future treatment and handling of the tank wastes. The presence of PCBs makes the sludges unacceptable for shipment to tank farms.

Throughout Hanfords history, there has been a tendency for the technical staffs to push off the resolution of difficult waste problems to some undefined future using unproven technology by disposing of wastes to the tank farms. Often this was predicated on a comparison of the costs. This EIS proposes the sludge be disposed to tank farms in the same manner and for similar reasons. Until the wastes are being removed from the tanks and the disposition process (presumably vitrification) is in full operation, no new types of wastes should be allowed in the tanks farms. Even then, prior to their disposal to the tank farms, a representative waste stream should be fed to the disposition process (melter) to ensure that it is capable of handling these wastes.

The risks from the tank wastes are dominated by cesium-137 and strontium-90 and their daughters in the near term. In the long term, other isotopes and pathways are likely to dominate. Technetium-99, iodine-129, plutonium (all isotopes), uranium (all isotopes) and neptunium-237 may be most dominant via various pathways and at differnet times. Addition to the burden in the tanks of any of these isotopes will directly increase the risk resulting from the tank wastes over the long term.

Additionally, complex wastes which include abrasive solids are especially difficult to handle. These tend to destroy pumps and cause excessive wear, plugging and premature failure of piping and handling systems. Adding more of these materials will only increase this problem. This discussion also applies to all other options which envision disposal of the sludge to the tank farms.

20. Details of Alternatives, No Action Alternative, page 3.7, fourth bullet. Minimizing the loading of the resin could conceptually be accomplished in at least three ways. First, remove the resins from service as they near a control limit. Second, change the resins to formulations which will not significantly remove TRU from the water. Or, third, add treatment system components ahead of the resins which are designed to selectively remove TRU. Reduction of the loading of TRU and other radioactive materials on the resins should only occur to mitigate or resolve problems caused by this combination, such as radiolytic decomposition of the resins. It should not be done to meet an meet an arbitrary definition of contaminant level, such as TRU waste. The hazards posed by these materials remains the same.

The first alternative does nothing to reduce the problem. It only increases the waste volume. If it is done to avoid the TRU waste classification, pursusing this alternative would only lead to additional burdens of transuranic materials being disposed of to the ground at the Hanford site. This will increase the total burden of such materials and act as a cumulative impact on the radioactive waste plumes and future risks. This alternative should NOT be pursued.

The second alternative may reduce the TRU loading on the resin, but will do so at the expense of increasing the TRU levels in the basin water.

The third alternative necessitates additional systems. This adds to the complexity of the system and its maintenance. It has the advantage of seperating the TRU materials from the rest of the waste and minimizing the volume of this waste stream.

Whatever decision is reached, the wastes generated will contribute to risk at some location. This represents an additional source term for those risk calculations and is a part of the cumulative impacts caused by the actions undertaken as a result of this action and USDOEs activities.

21. Details of Alternatives, Section 3.2.2, Enhanced K Basins Storage Alternative, page 3.12, third paragraph. The sludge is a waste from the slow water dissolution reprocessing of the fuel. The spent fuel sludge in the K-East Basin in addition to potentially being TRU waste is best described as High Level Waste and mixed waste. USDOE did not intend to cause this slow water reprocessing, but that does not change the character of the waste.

A third option exists and should be selected for the sludge - drying and passivation followed by canister storage along with the fuel awaiting ultimate disposal.

Also, the EIS does not adequately analyze the potential chemical impacts on the tank wastes, impacts on the disposition of the tank wastes, or the impact on the long term risks from the tank waste residuals. This discussion also applies to all other options that envision disposal of the sludge to the Hanford tank farms.

Similarly, land disposal of the sludge presents similar cumulative risks which must be addressed if land disposal is proposed for the sludge. NRC licensure may be required in either case.

22. Details of Alternatives, Section 3.2.2, Enhanced K Basins Storage Alternative, Water Disposition, page 3.14. In 1993, as a result of a report that the plutonium in the sand filter backwash pit had exceeded an operational safety limit, we asked a large number of questions. Many of these were never answered. A series of these questions had to do with concerns over criticality safety in the geometry of the piping and treatment systems. We forwarded our concerns to the Defense Nuclear Safety Board, who in turn forwarded some of them to the Environmental Safety and Health staff at USDOE. This contributed to the analysis of the condition of spent fuels in the USDOE complex as reported in the Spent Fuel Working Group Report. Volume 1 details the condition of the fuel in many storage basins around the USDOE complex. It is apparent from the pictures of some of these fuels that a differential chemical/physical reaction may be occurring which may result in segregation of the uranium, plutonium and structural components. We were concerned in early 1993 that this may be the case.

    Our concern was heightened when the sand filter back wash pit was mixed and resampling then showed a lower plutonium content. If this indeed happened, this would tend to confirm that physical/chemical separation of the plutonium has occurred to some degree. If the plutonium is seperating from the uranium, adequate criticality controls may not be in place.

23. Details of Alternatives, Section 3.2.3, New Wet Storage, page 3.15-17. This section omits any discussion of the treatment of air emissions which would have to occur for such a facility. The fuel must be expected to continue to slowly reprocess itself in the water until all available damaged fuel has fully degraded. During this time, the fission product and actinide inventory of the fuel will be released into the containers or basin. Some portion of this may be released to the air during normal operations, and significant releases may occur in an accident.

24. Details of Alternatives, Section 3.2.4, Drying/Passivation (Conditioning) with Dry Vault Storage Alternative, page 3.21, fourth bullet. This alternative should also detail exhaust/ventilation treatment and control

during the drying operation. At 50 degrees C, some of the more volatile fission products may be driven off the fuel and into the exhaust gas stream. Some of these already present a radiological control problem in the basin structure.

25. Details of Alternatives, Section 3.2.4, Drying/Passivation (Conditioning) with Dry Vault Storage Alternative, page 3.21, fifth bullet. The EIS should also detail the potential environmental/ecological impacts of a venting/release from the MCOs in transport or in storage. If the canisters are stored in an inert gas atmosphere, venting may allow atmospheric oxygen to enter the container. Based on British Nuclear Fuels experience, this may lead to a fire and constitute a significant accident hazard - both to people and the environment.

26. Details of Alternatives, Section 3.2.4, Drying/Passivation (Conditioning) with Dry Vault Storage Alternative, page 3.21-31. This option does not discuss the necessary airborne radioactive contaminant controls from this facility. The controlled oxidation of the fuel will release many of the fission products. At 500 degrees C, a large portion of these may volatilize into the gas exhaust.

27. Table 3-2. The risks stated for the Enhanced K-Basin storage and No Action alternatives do not include the potential risks of an earthquake, followed by basin drain down and fuel ignition. Arbitrarily limiting the risk evaluation to not include this analysis is unacceptable. Despite the small probability of this event, the magnitude of the consequences necessitate its inclusion.

28. Table 3-2. The stated risks for foreign processing from a transport accident appear to greatly understate the potential risk.

29. Table 3-2. The table lists the basin sludges as low level wastes. These wastes are probably High Level Wastes by definition, and mixed wastes by characteristic (PCBs), as well as possibly being TRU waste.

30. Section 4.6.3 Seismic Hazards, page 4.14, last sentence. The Uniform Building Code classifies the seismicity of eastern Washington as Zone 2B. Also, it should be noted that the 1991 Uniform Building Code (UBC) specifies an Importance Factor of 1.5 be used for this application (1991 UBC

2336(b) footnote 2) rather than the 1.25 specified for hazardous occupancies (1991 UBC Table 23-L). The provisions of the Uniform Fire Code (UFC also apply. Article 80 of the fire code provides specific limitations and controls requirements for radioactive materials.

31. Section 4.6.3 Seismic Hazards, page 4.16, first full sentence states "The most recent probablistic seismic hazard analysis calculated an annual probability or recurrence of 5×10^{-4} for exceeding the design basis earthquake." This corresponds to a risk over 5 years for the no action alternative of 2.5×10^{-3} and over the 40 years of the enhanced storage alternative of 2×10^{-2}. A two percent risk is a significant risk. Even a one-quarter percent risk is significant. Both support requiring analysis and reporting of the potential consequences of a beyond design basis earthquake scenario at the basins.

32. Section 4.8.1, Surface Water, page 4.24, second sentence states "A catastrophic flood caused by 50% failure of Grand Coulee Dam would cause a flood evaluation exceeding the height of the K Basins (DOE 1989, Appendix B))" This alone should disqualify the enhanced K-Basins storage alternative from consideration and support the early removal of all fuel and wastes from the basins and the surrounding areas.

33. Section 5.11, Transportation, Page 5.45-62. (See also section 6.1) The computer codes selected do not take into account the specific route transport risks. This is important for the rail and road routes through Oregon. The rail route includes transport through a constricted canyon with limited access for emergency responders, directly adjacent to the river on Umatilla tribal lands. The codes do not adequately address the potential impacts to the river or to tribal lands and rights.

The road route down Interstate I-84 includes dangerous sections over Cabbage Hill and through Ladd Canyon. Both areas are subject to sever microclimates and road conditions. The computer codes do not adequately address accident probabilities for these areas. They do not ensure adequate preparedness and planning to avoid shipping in inclement whether. They also are not predicated on shipment of highly damaged fragile and corroding pyrophoric spent nuclear fuel with significant quantities of loose radioactive materials and uranium hydrides, and hence can not be assured to adequately evaluate the potential releases of radioactive materials in an accident. This analysis need not be performed unless the foreign processing alternative is considered for selection.

34. Section 5.11, Transportation, Page 5.45-62. (See also section 6.1) For the reasons noted above, the codes do not adequately examine the potential consequences from a transport accident through the Columbia River Gorge, over the Cascade passes or in a major Metropolitan area of either Oregon or Washington. They also do not adequately address the potential risks and consequences of an accident at the dockyards or on board ship either at the docks or in transit to sea, or at sea. This analysis need not be performed unless the foreign processing alternative is considered for selection.

Additionally, based on the public comment on the recent EISs for shipment of foreign research reactor spent fuel, public opposition to such a shipping campaign must be expected to be extremely high in both Oregon and Washington.

35. Section 5.14, Waste Management, Section 5.14.1 No Action Alternative, page 5.74-75. The impacts must be expected to be greater each year than at present. The fuel is continuing to corrode at an increasing rate. This will increase the quantities of waste and levels of contamination each year. Due to a basin leak in 1993, the basin water temperature was raised to attempt to cause basin components and waste to swell, thereby sealing the leak. This appears to have been effective. However, historic K-Basins documents note that the rate of corrosion and release of fission products and actinides to the pool water doubles for each ten degree C rise in the basin water temperature. This is in accord with expected chemistry principles. The elevation of the basin water temperature will also increase the amounts of waste generated over historic trends.

36. Section 5.15 , page 5.83-112 This section does not include an analysis of the impacts of routine and accident releases of radioactive materials on the environmental receptors. This may be important particularly for the species list or under consideration for listing as rare, threatened or endangered under State or Federal law.

37. Section 5.16, Cumulative Impacts Including Past and Reasonably Foreseeable Actions, page 5.113-115. This section does not identify the

potential cumulative impacts to health and the environment as a result of accidental releases.

Section 5.15, identifies several potential accident scenarios and their probabilities. Many of these have high risks of occurance.

Cask Drop	1-14%
Spray Leak	10-100%
Liquid Release	1% per year
Fuel Removal	0.8-12%
MCO Overpressurization	0.04-4%
Crane Drop	0.8-1.4%

The risks from these and the chance of their occurance are sufficiently large that the EIS should estimate the potential cumulative impacts that these may cause on health and environment.

38. Section 5.16.5, Occupational and Public Health, page 5.117-118. The lifetime cancer risk from background and natural radiation is high. It is inappropriate to measure the impacts on occupational and public health by comparison against this large background. Additionally, this section omits any discussion of the potentially large impacts if a catastrophic incident, such as an earthquake or terrorist attack were to occur at the basins. The consequences of either of these events could be quite horrible.

39. Section 5.17, Adverse Environmental Impacts that Cannot be Avoided, page 5.118. As with the preceding sections, this section omits discussion of the potential impacts to the environment, and particularly to sensitive receptors or rare, threatened or endangered species from accidents.

40. Section 5.18, page 5.119. There is no reasonably foreseeable need for any of this material as fuel in the future. There is also no reasonably foreseeable likelihood that U.S. policy prohibiting reprocessing will be changed to allow the separation of the uranium or plutonium from this waste

41. Section 5.20.3, Cultural Resources, page 123. If native american remains are unearthed, construction may have to be halted, followed by construction at a new site.

42. Section 5.20.6, Ecology, page 5.124. The preference for previously utilized or disturbed sites is encouraging. If the record of decision selects a different site, the language in the record of decision needs to do more than state what could be done to mitigate for habitat destruction. It needs to specify what will be done. This should include specific language detailing the amount of offsetting habitat improvement which will be carried out, commitment to use only native seed and plant stock, and to monitor the progress of this replacements development with adjustment in the plans as needed. It is not sufficient that their be a goal. The results of the habitat replacement must be the measure of its adequacy. Work needs to continue until the replacement habitat is fully functional and biologically equivalent to or greater than the habitat impacted.

43. Section 5.20.10, Accidents, page 5.125-126. The potential severity of many of the accidents which may occur during the process of transporting and stabilizing the fuel are large. The chances of these accidents occurring is also large. The condition of the fuel in the basins both physically and chemically is substantially different from the baseline evaluations used in the emergency preparedness plans. This is especially true of a potential fuel fire under several scenarios (fuel drop, MCO overpressure, basin drain down). The Hanford Emergency Assessment Resource Manual (HEARM) and the K-Basins Facility Safety Analysis Report (FSAR) need to be updated to include more accurate estimates of the probability and potential severity of incidents at the K-Basins and involved in stabilizing the fuel. These should also be included in sitewide emergency drills.

44. Section 5.21, Environmental Justice, page 5.127-132. The EIS identifies the native american populations in this section. It omits any discussion of USDOEs tribal treaty obligations. It also omits any discussion of the tribal treaty reserved rights of the Yakama Indian Nation, the Confederated Tribes of the Umatilla Indian Nation and the Nez Perce Tribe. All of the Hanford site is impacted by these treaty reserved rights. The disproportionate impact to the tribes occurs primarily from USDOEs preventing tribal members from using the site lands in accordance with the treaties.

45. Section 6.3, Radiation Exposure to Members of the Public, page 6.3. In addition to USDOE Order 5400.5, NRC and EPA regulations limit exposures to the public. These limits are being lowered and are expected to

be published at 10 mrem per year. The USDOE standard is inadequate and is not limiting. Additionally, EPA limits public exposure via the water route to 4 mrem per year.

46. Section 6.8, Species Protection, page 6.5-6. The EIS recognizes that Washington has identified the shrub-steppe habitat as priority habitat on page 4.31, second paragraph, and that this habitat is home to a large number of species which are either listed or under consideration for listing as rare, threatened or endangered by either the State or Federal governments, page 4.29-31. Each additional impact to this habitat will increase the pressures on these species. It is important that any replacement or rehabilitation of habitat be done using natively derived se and plant stock.

State of Washington
DEPARTMENT OF FISH AND WILDLIFE

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1315 W 4th Ave, Kennewick, WA 99336

21 December, 1995

Ms. Barbara Ritchie, NEPA Coordinator
Environmental Review Section
State of Washington
Department of Ecology
P.O. Box 47703
Olympia, WA 98504-7703

Dear Ms. Ritchie:

Subject: Comments on the draft Environmental Impact Statement titled *Management of Spent Nuclear fuel from the K Basins at the Hanford Site, Richland, Washington,* document DOE/EIS-0245D.

General Comments

The KE Basin has leaked water in the past and may still be leaking unknown quantities of water contaminated with radionuclides to the Columbia River Ecosystem. Neither, KE or KW basin, was designed for a 80 year life expectancy. Washington Department of Fish and Wildlife (WDFW) concurs with the purpose and need of this action, and with a dry storage action. However, this EIS lacks adequate information to decide which of the three dry storage alternatives should be the preferred.

The three wet storage alternatives are unacceptable because they can not fully assure protection of the environment. All wet storage alternatives are susceptible to a seismic induced breach of the storage basin allowing complete drainage of water. A complete loss of water would lead to autoignition of the spent nuclear fuel. This accident scenario is not discussed along with environmental impacts from such an event. The new wet storage alternative fails to discuss a seismic scenario.

Under the drying/passivation alternative, WDFW is concerned with the uncertainties which exist regarding the chemical state and pyrophoric nature of the spent nuclear fuel in the KE and KW Basins. This EIS fails to adequately discuss these uncertainties and to what extent these uncertainties would have on the environment.

WDFW has determined the option under the preferred alternative, utilizing the reference site for facility siting, to be unacceptable. The reference site is clearly outside the exclusive waste management area recommended by the Hanford Future Site Uses Working Group.

WDFW supports the utilization of the Canister Storage Building (CSB) for this action. If the CSB site can not serve the needs of this action, then, WDFW suggests siting the facility in the following order of preference: 1) within the 200 east or west fenceline in a previously disturbed area, 2) within the 200 east or west fenceline at an undisturbed area, 3) between the 200 areas at a disturbed area and within the exclusive waste management area, 4) between the 200 areas at an undisturbed area and within the exclusive waste management area. Siting the facility at alternatives 2 and 4 will require compensatory mitigation for destruction of State Priority Habitat.

The foreign processing alternative is not an acceptable alternative since extensive transportation would be required increasing the probability of an environmental accident. The discussion for this alternative fails to mention any potential ecological accidents.

Mitigation is discussed briefly in the summary. Loss of State Priority habitat should be mitigated through compensatory mitigation such as that mentioned in the summary on page vii. However, this concept is lacking elsewhere in the document. This EIS should commit to a project specific Mitigation Action Plan to perform compensatory mitigation at a 3 to 1 replacement ratio for habitat loss, and the 3 to 1 ratio should be stated in the EIS.

The EIS should provide a description of the habitat which was present at the CSB prior to site clearing. If a biological assessment was not performed prior to site clearing, then the most recent aerial photographs (prior to CSB site clearing) should be used to assess pre-existing habitat conditions (value). It may be appropriate for the Spent Nuclear Fuel EIS to provide compensatory mitigation for the loss of habitat value which occurred from the CSB site clearing.

Specific Comments

Section 4.9.1, first paragraph, second sentence. Suggest changing the word "productivity" to the word "diversity".

Section 4.9.3, page 4.29, first paragraph, last sentence. Request the following sentences be inserted prior to last sentence. "The Hanford Reach contains the last significant spawning habitat for Fall Chinook salmon. In addition the Hanford Reach comprises the only significant remaining section of the Columbia River where white sturgeon are able to spawn".

Page 4.29, section 4.9.4. This section should mention that the National Biological Service has designated shrub and grassland steppe as an endangered ecosystem in the states of Washington and Oregon.

Section 5.2.2. Refer to general comments regarding reference site.

Page 5.38, Figure 5-1. Refer to general comments regarding reference site.

Page 5.113, section 5.16.1. WDFW has found the discussion on cumulative impacts to be inadequate. The destruction of 20 acres of State Priority habitat along with past, present, and future actions will have a significant affect on the flora and fauna of the Central Plateau, Hanford Site. Other projects which have had impacts to State Priority habitat include: Environmental Restoration Disposal Facility (165 acres minimum; potentially impacting 1024 acres), Safe Interim Storage EIS (74 acres), 240 access road (18 acres), Solid Waste retrieval Complex (46 acres), Tank Waste Remediation System EIS (148 acres). The National Biological Service has designated shrub and grassland steppe as an endangered ecosystem in the states of Washington and Oregon.

Page 5.119, section 5.19. This section should include a statement which commits to restoring the land with native vegetation once the facilities are decommissioned.

Page 5.120, section 5.20. Please refer to general comments on mitigation.

Thank you for the opportunity to provide comments on this EIS. If you have any questions regarding these comments, please contact me at (509) 736-3095.

Sincerely

Jay McConnaughey
Habitat Biologist, Hanford Site

jlm

cc:
Washington Department of Ecology
Dave Lundstrom
Geoff Tallent
Tom Tebb
Washington Department of Fish and Wildlife
Ted Clausing
Brent Renfrow
Gordon Zillges

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
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December 27, 1995

Dr. P. G. Loscoe
K Basins SNF EIS
US Dept of Energy
PO Box 550, MSIN S7-41
Richland WA 99352

Dear Dr. Loscoe:

Thank you for the opportunity to comment on the draft environmental impact statement (DEIS) for the management of Spent Nuclear Fuel (SNF) from the K Basins at the Hanford Site, Richland, Washington (#DOE/EIS-0245D). We have reviewed the DEIS and have the following comments.

We have held the position that the fuel should be relocated to interim storage away from the river, until the long-term geologic repository is available. USDOE should be commended for taking the actions necessary to resolve the urgent environmental health and safety problems of storing spent nuclear fuel in deteriorating structures adjacent the Columbia River.

Portions needing further clarification are as follows:

1. The DEIS makes no mention of what USDOE headquarters is calling "materials-in-inventory" (MIN) of which the SNF is considered part. How will the preferred alternative be affected if the material is or is not valued as surplus inventory? If it is determined as excess, and therefore a waste, what contingencies are provided?

2. Hanford federal agreement and consent order Amendment 5 for Facility Transition and Decommissioning and Decontamination contains terms not included in the glossary.

3. New construction activities involving new septic systems should be integrated into the Hanford-wide infrastructure plan.

Transportation:

1. Potential on-site exposure to unauthorized personnel. At several points, the transport analysis assumes roads used for transport are not open the public. (See page 3.13,

Consistent with the Department of Ecology's responsibilities as Washington State's coordinator for the National Environmental Policy Act, we are also forwarding the comments received from the State of Washington, Department of Fish and Wildlife.

If you have any questions on the comments made by Washington Department of Fish and Wildlife, please call Mr. Jay McConnaughey at (509) 736-3095.

Sincerely,

Marvin L. Vialle
Environmental Review Section

MV:ri
95-8264

cc: Ron Effland, Kennewick
Jay McConnaughey, Kennewick

BNFL Inc.

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December 29, 1995

Dr. P. G. Loscoe
U.S. Department of Energy
Richland Operations Office
P.O. Box 550, MS S7-41
Richland, WA 99352

Dear Dr. Loscoe:

On behalf of BNFL Inc., I am pleased to submit the following comments on the draft EIS on the Hanford N-reactor fuel (ref. DOE/EIS-0245D).

It is difficult to make judgments as to the costs or technical merit of options that have never been put into practice and for which there is not even a conceptual design in place, such as the "preferred alternative" (drying/passivation with dry storage). Furthermore, this preferred alternative is not a substitute for processing (rather, it only postpones the need for processing), and thus will add to the total lifecycle costs when compared to the processing alternative alone. As an illustration of this situation, the Department recently selected processing as the preferred alternative for managing Mark-16 and Mark-22 targets (Federal Register, Vol. 60, No.243, pp. 65300 - 65316), because the processing alternative resulted in incremental cost savings and eliminated the large uncertainties associated with the ultimate disposition of this material when compared to the nonprocessing options. Furthermore, in making this decision on the Mark-16 and -22 targets, DOE felt that, even though all the alternatives considered were technically "feasible", the more an alternative varied from the "historical processes and facilities" previously used, the greater the technical uncertainty and the greater the extent to which new facilities would be required.

In contrast, the overseas processing alternative is a proven technology, with well-established costs, and demonstrated track record (case in point: the canning, transport, and processing of the heavily damaged metallic fuel from Sallugia/Latina), and therefore can be accomplished readily with no uncertainties, rendering the fuel stable for permanent disposal without going through an interim, costly storage regime.

Nevertheless, recognizing that many other considerations were factored into the identification of the preferred alternative for the Hanford N-reactor fuel, it is BNFL's desire merely to point out some discrepancies in the text, so that the other alternatives are represented in the right perspective.

The following comments are specific to the text, and are referenced by page number:

p. 3.2 - "New wet storage alternative" - disadvantages
Further hydriding is less of a problem if it occurs with free access to oxygen, such that only low concentrations of UH3 are formed. Hydride becomes a problem only if oxygen is excluded (yielding higher UH3 concentrations in corrosion product) and there is a subsequent possibility of exposing the fuel to air. The main disadvantage of wet storage is the continued rate of corrosion of the exposed fuel generating more sludge and rendering the fuel more difficult to handle. Thus, a philosophy of maintaining damaged fuel wet with free oxygen access can work for short term storage (a few years).

p. 3.3 - "Drying/passivation with dry storage"
Vacuum conditioning at 300C will probably remove water, but given the large inventory of fuel in each MCO, it will be impossible to know how successful this has been. Any water remaining will continue to generate hydride.

p. 3.5 - "Foreign processing"
The principal disadvantages are quoted as relating to transport, shipping, casks and cost of a new head end. The transport issues are really insignificant - this has been done before (ref. Sallugia/Latina) without incident and a full safety case was produced. There certainly would have to be more risks assigned to the other alternatives as compared to the known, demonstrated, manageable risks associated with transport of this fuel (metal fuel is regularly transported internationally without incident).

A new head end at the processing facility is no more of an uncertainty or cost than the proposed drying/passivation plant and has the advantage of being based on existing proven technology.

There should be little or no staging required for off-site shipment of fuel for foreign processing. The fuel can be removed from the basin as it is shipped, and shipping schedules can easily meet the required basin emptying timescales.

p. 3.29 - "Drying/passivation (Conditioning) for Dry Storage"
Controlled admission of oxygen would certainly stabilise some of the finely divided uranium. However, there would be no guarantee that all such material was stabilised. Under controlled oxidation the uranium will form a very thin protective coating of oxide which could be removed by subsequent abrasion, revealing further pyrophoric surfaces. The swelling associated with oxidation could effectively seal off extensive regions of unpassivated material.

p. 3.39 - "Foreign Processing Alternative"
Final disposition of the fuel will be much more expensive in the future if a dedicated processing facility has to be constructed specifically for this fuel. There is no option to dispose of passivated metallic fuel directly. Irradiated uranium metal will never be suitable for disposal in a repository due to its reactivity.

pp. 3.40 - 3.42 - "Packaging, transport and processing"
The nine year period for shipment of fuel for foreign processing is excessive. There is no transport

constraint which dictates this long a program. Seven years can be achieved easily, and given sufficient casks, the fuel can be transported as quickly as it can be removed from the basin (ie on the same timescale as any other option).

The figure used for number of shipments (4000) has to be a typographical error! BNFL's estimates assumed 600 shipments, on the basis that the shipments would be completed in 5-7 years (not the 9 years shown in Figure 3.11).

pp. 3.5, 3.43, and 5.80 - "Returned vitrified waste"
Vitrified waste does not have to be returned to Hanford. It can be returned directly to the US repository when this becomes available.

p. 5.37 - "Processing alternative"
Scenarios and consequences relating to water quality do not apply in the case of foreign processing - there are none!

pp. 5.133-5.143 - "Costs"
The foreign contract costs quoted are $0.3B to $0.5B higher than the estimates given by BNFL. In contrast, the cost of the drying/passivation process seem to be underestimated (no allowance for development) and the costs for on-site processing have been underestimated (no allowance for restart of the Purex plant, if it could be done at all). If DOE wants to be consistent throughout, then it should use the lower range of the overseas processing figures, i.e., approximately $1.9B. This is a lifecycle cost and should be compared with the sum of drying/passivation and subsequent on-site processing - i.e., $3.7B.

Drying/passivating does nothing to make final preparation for disposal any easier. It may limit expenditures in the short term ($1B) and defer the rest ($2.7B) for up to 40 years, but carries with it the risks of technical inadequacy - especially if no development is planned or budgeted for the final stabilization process. Postponing the final stabilization for even a few years runs the risk that overseas processing will not be available at a later date, either due to capacity commitments or end-of-life of the processing plant.

One aspect of the overseas reprocessing costs that was not addressed in the text is the phasing of the payments, wherein the costs for transportation would not be due until fuel is actually delivered to the processing plant, and wherein the costs of the reprocessing are phased over time, as opposed to requiring a "lump sum" sort of fiscal commitment.

General Comment of Transportation
The assumptions regarding transportation risks are, in general, quite negative. In fact, however, BNFL's experience in transporting similar fuel around the world over the past 40 years speaks for itself, and is the real measure of the relatively small risk inherent in such an undertaking.

On behalf of BNFL, I wish to express my appreciation for the opportunity to comment on this important document. As BNFL has previously stated, we extend an offer to help in any way we might be able to in the successful management of this fuel.

Yours truly,

Marilyn F. Meigs

Marilyn F. Meigs
Vice President
Fuel Cycle and Materials Processing

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Dr. P. G. Loscoe
NEPA Document Manager - K Basins SNF EIS
U. S. Department of Energy
P.O. Box 550, MSIN S7-41
Richland, WA 99352

Subject: DOE/EIS-0245D, "Management of Spent Nuclear Fuel from the K Basins at the Hanford Site, Richland, Washington

General comment: Moving the fuel to a centralized, modern storage facility at the Hanford Site is the right thing to do. The Department of Energy is making essentially no progress in dealing with any permanent storage options for spent fuel or transuranic wastes. Therefore serious, well designed interim storage facilities are absolutely necessary. The K Basins were never meant for long term storage, and the Department of Energy has, over the last 15-20 years SEVERELY underfunded basic maintenance at this key facility. Therefore it is in a serious state of disrepair and condition.

However, try not to repete this mistake. Do not let the new facility also deteriorate due to poor follow-through.

Specific Concerns:

Procedural: Obtaining a copy of this EIS was very difficult. Once one got a copy, there were directions on how to obtain a copy included. Apparently DOE has developed their "preferred list" of individuals and groups that get copies. The rest of us must rely on word of mouth or hoping to catch a public announcement (which tended to discuss public meetings -- NOT where to get information). Other DOE sites and federal agencies often send out a postcard to a very wide list (developed from attendees to public meetings, those asking for information, etc.), asking if they would like a summary or the full EIS. If you did this, it was certainly to a very 'select' group. I would encourage you to try to reach a wider group. Having 1 or 2 copies at the WSU Tri-Cities campus is not the solution.

Second, as a worker at the Hanford Site, I was strongly discouraged by both my contractor management and by the DOE management not to attend the public meetings. I have seen several employees -- both from the contractor and from DOE who have been clearly harassed by management for attending public meetings and asking questions (even though the public meeting was in the evening, so that the workers, who do pay taxes in this county, were on their own time. Yet it is the workers who will take the brunt of the risk to do this cleanup work. The DOE should be encouraging workers to speak up, not discouraging them. After all the problems with whistle blowers and promises to treat workers with respect, it was certainly surprising to see how poorly workers who asked questions were treated. To make this process meet the intent of the law, workers should have equal opportunity to comment as the general public. My colleagues and I were going to testify, but since they were taking names and company affiliations, we chose not to, to avoid negative exposure.

Technical Comments:

- Though I do believe that DOE should proceed forward with use of the Canister Storage Facility construction to store the fuel for the long term, there is not the 'crisis' that DOE is trying to create. There have been ample studies of the relative risks to the public to indicate another year or two would not cause undue harm to the public. Yet those 2-3 years in the schedule could make the difference from a high risk, high exposure to the workers and a very well designed, safe transfer. Do not put workers at risk to high exposure, excessive hours, etc. just to meet your artificial and self serving schedule date. The tax payers are also the losers also, because we have to pay much more for your 'rush', as well as potentially have more risk to the public.

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- Do NOT process fuel at the 100K area. There was a VERY brief discussion in the EIS about a 'cold vacuum drying' facility at 100K. It appears you purposely downplayed the risk and description of this in the EIS to disguise this new processing facility at the River. 50 degrees C is not all that cold and if I understood the description, this is clearly processing. I though DOE committed that they would not be building new operating/processing facilities near the River. This does not make good financial sense either. If DOE does it's usual thing, this 'new processing facility' will be built to excessive criteria to meet huge earthquakes and tornadoes, etc. (not that we should see them in the 3-4 years this building will be used). It will obviously have to have a state of the art air filter system, with all the processing. Yet this new asset that should be available for other cleanup activities, will be placed in an area inaccessible to any other major site. All new buildings should be located in the central 200 areas. And that excuse that the fuel must be shipped dry is one of the worst excuses I have heard from DOE yet. How many thousands to shipments have been made wet from the 100 areas to the 200 area. For the good of both public and the workers, all new processes should be done in the 200 areas and the fuel should be removed and shipped in the same manner (well cars by train) that have been successfully demonstrated for years. Then unload them into a small water pool for trans-loading and processing in a building DESIGNED for that (e.g. filters, remote handling tools, etc.). It likely would not even cost more, since the very expensive shipping trucks and casks would not be needed. It would also use existing equipment on site.

- Don't use trucks. Use the train system. The trains at Hanford have a FANTASTIC safety record. We already are having continued problems with big crawlers and multiple trucks on the road for cleanup and solid waste. If you must use trucks, the road from 200 area to 100K should be totally redone. It is not designed for these big and steady loads. There are already bad potholes, no shoulders, narrow lanes and little passing areas(as well as lots of big animals that run across the road). Whoever picked trucks over the train has NEVER had to drive that road over a one year period. On page 5.53, even your own data show that trains are much better. If you honestly assessed the cost of road upgrade and repair, then the cost between train vs. truck would probably be about the same.

- Prior to proceeding down your preferred option, you should balance the ALARA dose to workers (for having to do more work in a building DOE never kept up) and to the fishermen by the river bank to the small risk of shipping via the existing train system to the 200 area site and doing all process/handling work in a new, filtered facility.

- DOE should look at the potential savings of designing a proper MULTI USE Storage facility (for some of the high dose transuranic garbage, vitrified tank wastes, spent fuel, etc.) It would not be surprising for a small increment increase, this new building can be a big asset for the cleanup, and not a one-subject item. Use the systems engineering tools you brag about.

- DOE's focus should be to do the minimum amount of work in the 100K area and get the fuel moved out as soon as possible. This means not setting new and aggressive standards on the old facility and process. This is usually done under the excuse of safety, but often ends up with actually increasing the risk to workers and nearby residents. Please, before you blatantly apply rules (NRC, tornado, etc.) look at the real risk savings. It is one thing to design the new 40 year storage facility to very stringent standards, but the facilities that have a 2-5 year life should just meet the absolute minimum.

Concerned Citizen
Richland, WA
December 13, 1995

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UNITED STATES DEPARTMENT OF ENERGY

K-BASINS SPENT NUCLEAR FUEL MANAGEMENT

HANFORD SITE, RICHLAND, WASHINGTON

EIS SCOPING MEETING

December 12, 1995
1:00 p.m. and 7:00 p.m.
Pasco Red Lion Inn
2525 North 20th Street
Pasco, Washington

BRIDGES & ASSOCIATES
Certified Shorthand Reporters
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Kennewick, WA 99336
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transcript. So if you do have written comments to supplement your oral comments, if you have them here today, please provide them to me, and I will mark them as an exhibit and include them in the record.

As I mentioned earlier, the comment period continues through December 29th, 1995, and you can provide comment in writing by mailing them to Dr. Loscoe.

With that, I'd like to begin the public comment portion of this hearing. And we have a couple of individuals who have indicated an interest in commenting. I believe the first one is Mr. Gordon Rogers.

Mr. Rogers, would you please step forward to one of the microphones?

MR. ROGERS: My name is Gordon Rogers, 1108 Road 36, here in Pasco.

I am speaking strictly for myself as a private citizen today. I know a number of people will recognize me as a member of the Hanford Advisory Board, holding one of the public-at-large seats. I have no idea whether the Board itself will offer any comments on this EIS. However, I want to make it clear, I am not authorized to speak for the Board, and I will not pretend to do so.

I have some general points that I'd like to give to you for your consideration. I hope you don't interpret these as smart-alecky, but they are concerns that I have had for a number of years regarding the EIS process, the NEPA process, I should say.

Let me begin by saying that I have no wish to oppose the preferred alternative for this program. And I think it is an excellent choice, and I'm prepared to support it. However, there -- as I reviewed briefly this EIS, a couple of major points jump out at me.

First of all, as I understand it, an EIS is required in cases where the government proposes an action that may have significant impacts. As I looked briefly at table 3-2, which is the cumulative summary of environmental impacts and costs, I was struck by the fact that the impacts are, at least to my unspecialized mind, rather trivial.

And I think a legitimate question can be raised whether we are delaying getting on with the important work of cleaning up Hanford by spending rather substantial sums of money and time in order to carry out a legal mandate to follow NEPA procedures.

I would strongly urge the Department of Energy and the Washington Department of Ecology to seriously attempt to find some way to be sure that they can avoid breaking the laws, but at the same time, expedite this process in the interest of saving money and time.

I had the same comment on the Safe Interim Storage EIS. Once again, we see one that looks very safe to me compared with further delay, so let's find a way to move ahead.

The other point is, I don't know, I hope I won't give somebody the wrong idea, but as I look at the relative cost of these alternatives, again, if I were a Congressman or somebody with no ties to this area looking at this thing, I might very well say, gee whiz, the preferred alternative costs quite a bit of money, and the no action doesn't really cost much more.

On the other hand, the no action spreads the cost at a fairly level rate over 40 years, whereas the preferred action calls for some major capital funding in the near term. And I hope we're not setting a trap for ourselves here.

I don't know what to advise you how to cure that. You are bound to tell the truth, and I think you have. But, once again, I -- there's something wrong with this process, and I think we're a long ways from having finished it.

The second point I want to make is that I was rather disappointed in the cavalier treatment of the Washington Public Power Supply Systems Use Potential alternative. This was dismissed in about one sentence as being too close to the river and potentially involving some lengthy procedure for acquisition of those facilities.

Don't misunderstand me. I'm not saying that I know that would have been a better, cheaper alternative, but I was involved in recommending earlier in this program that those facilities be looked at carefully as one potentially usable way to do the job.

By comparison, you spent quite a bit of space evaluating an alternative for reprocessing in some foreign nation. And in view of the beating up you got when you proposed even just bringing back U.S. owned research reactor fuel to the United States, as required by law, I'm surprised that you were willing to consider shipping 2,000 tons of spent deteriorated fuel to Britain for reprocessing. I don't think you have come off very well.

I have only one specific comment about the process being proposed in the preferred alternative. I think the long term stability of uranium metal material is not assured and probably cannot be fully assured in the brief period that you have from the present until the passivation treatment begins.

And I would hope that you will have some provisions for assuring that the leak tightness and the inert atmosphere within the multi-canister containers can be assured over the long storage life.

Thank you very much. I have only had a brief time to review this document, and I may have further written comments, which I'll submit later. Appreciate the opportunity to comment.

MR. CAROSINO: Thank you for those comments.

We have another individual, I'm not sure whether he is here, is Murray Edwards in the audience?

Is there anyone else that is interested