START Confederated Tribes and Bands of the Yakama Indian Nation

Established by the Treaty of June 9, 1855



January 24, 1995



Mr. John Wagoner, Manager
Richland Field Office
Department of Energy
P.O. Box 550 A7-50
Richland, WA 99352

Dear Mr. Wagoner:

Subject: DRAFT ENVIRONMENTAL RESTORATION DISPOSAL FACILITY (ERDF) REMEDIAL ACTION/FEASIBILITY STUDY (RI/FS); COMMENTS ON--

Our letter of January 18, 1995 to EPA Region 10 and DOE/RL identified Yakama Nation disagreement with tentative decisions regarding the design of the subject facility.

This following comments are based on a review of DOE/RL-93-99, Revision 1, RI/FS, pertaining to the ERDF facility. Our comments indicate disagreement with the facility as it is presently planned. As we have documented in the past, we disagree because it would require perpetual institutional controls to effect monitoring/remediation, and would prohibit general, unrestricted use of the land by future generations. Such an imposition is inappropriate and inconsistent with use of the land and waters as guaranteed by the Treaty of 1855.

1. SUMMARY OF DESIGN AS PROPOSED--The ERDF is proposed to serve as the central receiving facility for remediation wastes generated from cleanup of CERCLA past practice units and RCRA corrective action activities primarily within the 100 and 300 Areas (including near the Columbia River) at the Hanford Site. Such a facility is called for under Milestone M-70-00 of the Tri-Party Agreement.

The ERDF would be designated a *Corrective Action Management Unit* (CAMU) under 40 CFR 264.552 and, as such, would accept only wastes originating from on-site. DOE states that the facility is expected to receive 28.5 million cubic yards of remediation wastes consisting of contaminated soils, sediments, sludges, burial ground waste, pond and trench waste and demolition debris including pipelines and ancillary equipment. This material would be classified as chemical, radiological (low-level) and low-level mixed waste.

The proposed location of the ERDF is on the 200 Area plateau between the 200 West and 200 East Areas. This location is nearly free of existing soil contamination, but is underlain with contaminated groundwater from the 200 West Area. The primary design element of the ERDF consists of a single trench excavated below grade. This trench would be filled with remediation waste and closed with a protective surface barrier. Supporting facilities including administration buildings, railroad spurs, waste off-loading and transport equipment and waste treatment and

equipment decontamination facilities are also included as part of the ERDF.

The subject RI/FS discusses cultural and ecological resources of the 200 Area, waste characteristics and contaminants of concern. The document also discusses remedial action objectives of the ERDF site and identifies, selects and evaluates certain remedial technologies and alternatives. Alternatives that would allow general unrestricted management of the surface and surrounding areas at 100 years past closure, including uses that include significant influx of water from agricultural activities, as was identified by the Yakama Nation in the scoping of the planning for the ERDF, are not considered.

2. GENERAL COMMENTS--

a. The ERDF would result in alternatives including excavation and on-site disposal ranking higher in operable unit RI/FS documents than alternatives involving treatment mechanisms. Thus, the ERDF inhibits recycling efforts and the identification and development of innovative technologies, such as calcining to reduce volume and eliminate toxicity, and melter/slagger recovery/waste separation processes, and ignores the systems-engineering approach to efficiently and effectively use available resources for cleanup of the entire Hanford Site. In addition in-situ soil washing using freeze barrier technology to separate contaminated and uncontaminated soils during remediation is not considered.

b. The ERDF would be inconsistent with and preclude implementation of the Yakama Nation's desired final remedy for the Hanford Site and thereby may violate section 300.430 (a)(ii)(B) of CERCLA. (Specifically, see comments 12 through 14 of ATTACHMENT A. Other applicable comments include numbers 4 and 16 through 19.)

c. The ERDF would be a permanent facility located on "sacrificed" land for the disposal of all wastes not identified for deep geologic isolation, regardless of contaminant concentrations and waste classification (chemical, radioactive, mixed). Disposal practices would be in violation of DOE Order 5820.2A. (Specifically, see comments 1 and 19 of ATTACHMENT A.)

The document does not consider the socioeconomic values placed on the land by the Yakama Nation, and provides little consideration of their cultural values of the land. (Specifically, see comments 5 and 15).

The ERDF would result in contamination of clean soils and the vadose zone beneath the site. (See comments 2 and 3).

The risk assessment is incomplete by not considering an appropriate worst-case irrigation-use scenario of the land, does not consider overall impacts to the population, does not consider bioaccumulation or mutagenic effects on current and future generations and food chain resources, and, does not consider cumulative risks from contaminants already in the groundwater system beneath the proposed ERDF location. (See comments 6 through 11 and 21).

The ERDF does not satisfy its objectives of preventing unacceptable direct exposure to the wastes, preventing unacceptable releases to the air and groundwater, and minimizing ecological impacts. (See comments 2, 5 and 12 through 14).

Sincerely,

Russell Jim, Manager
Environmental Restoration/Waste Management Program
Yakama Indian Nation

ATTACHMENT A: DETAILED COMMENTS ON ERDF DESIGN, (DOE/RL-93-99) REV 1. 38532

cc: K. Clarke, DOE/RL
J. Mecca, DOE/RL
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ATTACHMENT A: DETAILED COMMENTS ON ERDF DESIGN, (DOE/RL-93-99) REV 1.

1. **Page 1-1:** The documents state that remediation waste from the 100, 200 and 300 Areas is expected to consist of chemical, radioactive and mixed waste.

**Comment:** Throughout the document there is no mention of how, or if, the remediation wastes would be segregated within the ERDF to assure the entire disposed volume does not become mixed waste. Segregation and minimization of the waste material is required under Chapters II and III of DOE Order 5820.2A. These aspects are important to properly utilize available resources and minimize all aspects of potential future treatment and disposal activities.

2. **Page 1-2:** It is stated that supporting ERDF facilities including decontamination and leachate treatment systems will not significantly impact the long-term effectiveness of the site. Therefore, these facilities are not discussed in detail in the ERDF report. Also, leachate collection is not discussed.

**Comment:** It is not agreed that these supporting facilities should not be discussed in the report and that they may not have a significant impact on the long-term performance of the ERDF as it relates to protection of human health and the environment. As discussed in Appendix D of the document, significant volumes of leachate could be generated during operation of the facility. Estimated volumes of decontamination wastewater are not discussed. Depending on the type of collection, treatment and disposal proposed, the combined volumetric flowrate of these streams has the potential to significantly impact long-term contaminant availability to human and ecological receptors and thus the design and evaluation of the facility.

3. **Page 1-3:** It is stated in the document that the selected ERDF location was supported by recommendations provided by the Hanford Future Site Uses Working Group and, using CERCLA and CAMU criteria, because it is not located within a contaminated area of the Hanford Site.

**Comment:** It is not agreed that an area with uncontaminated soil should be used for the disposal of remediation wastes from the Hanford Site. The direct result of any disposal action within the proposed ERDF location would be the unnecessary and deliberate contamination of the underlying clean soil column and vadose zone and the continued contamination of the groundwater system. Furthermore, it is not agreed that location of such a facility in an area where contamination already exists would cause greater risk to the site workers since, in either case, the workers would be dealing with contaminated media and would essentially require that the same safety precautions be taken.

4. **Page 2-9:** It is stated that 2 new effluent disposal facilities are planned for the 200 Area. These facilities are the

Treated Effluent Disposal Facility Pond and the Effluent Treatment Facility Crib.

**Comment:** With the fact that ponds and cribs have long been the largest artificial source of recharge and contamination of the groundwater system beneath the Hanford Site, it is alarming to see such facilities still being proposed in an area such as the 200 Area where soil contamination exists (outside the ERDF) and where this contamination could be driven further into the underlying groundwater system. A systems-engineering approach must be taken with respect to all waste activities at the Hanford Site, focusing on treatment and beneficial re-use of the waste materials.

Such an overall site evaluation is necessary to assure impacts from other projects are properly integrated and considered in accordance with NEPA requirements.

5. **Page 2-24:** It is stated that the ERDF document has been expanded to include NEPA values not normally considered in a CERCLA RI/FS document. These values include socioeconomics, cultural resources and transportation.

**Comment:** Nowhere in the document is there a discussion of the socioeconomic values placed on the land by Yakama Nation, nor is there an assessment of how the ERDF site may impact the value of this land for current and future Indian generations. Also, although several historic areas have been identified that would be impacted by the ERDF (White Bluffs Road, basalt outcroppings and McGee Ranch) as well as artifacts and archaeological and paleontological areas within the ERDF, the report provides little consideration of these areas and the cultural and religious values placed on them by the Yakama Nation. The lack of concern over Yakama Nation values is typified in sections of the report that state the ERDF site will require an irreversible and irretrievable commitment of many resources including natural resources and borrow material. Also, shrub-steppe habitat, although important for many plant and animal species in the area and rapidly shrinking elsewhere in eastern Washington, would be completely destroyed by the ERDF site.

6. **Fate and Transport Model:** The base condition fate and transport model to predict groundwater concentrations at the ERDF boundary assumes the facility has no bottom liner and a non-engineered top barrier with an infiltration rate approximately an order of magnitude higher than what would be expected under current climatic conditions at the site.

**Comment:** The base condition model should have assumed an irrigation-use scenario for the site as a possible worst-case situation. Such a future scenario is possible as part of traditional and cultural Yakama Nation use of the land for pasturing stock and is a likely non-Indian usage in any case. This scenario would have resulted in higher groundwater contaminant concentrations, faster travel times to the ERDF boundary and,

therefore, far more contaminants of potential concern (including associated daughter products) being retained for evaluation in the risk assessment.

7. **Page 5-1:** It is expected that the contaminants of greatest concern from an ecological perspective will be identified with a human health risk-based screening process.

**Comment:** Without supporting facts, it is not agreed that human health screening values are also appropriate for ecological receptors. In addition, the report does not consider cumulative effects of exposure on the food chain cycle and how these exposures may ultimately effect human health and the religious, cultural and socioeconomic values placed on the land and its resources by the Yakama Nation, including its future generations.

8. **Page 5-3:** Benzo (g, h, i) perylene, 4-chloro-3-methylphenol, dibenzofuran, 1,3-dichlorobenzene, 4-methylphenol and sulfate contaminants in the soil do not have toxicity values with which to perform risk-based screening calculations. These contaminants were therefore not considered to be of concern for disposal at the site.

**Comment:** Surrogate toxicity values should have been assumed based on similarities with other available chemical data.

9. **Page 6-1:** Exposure to contaminated groundwater is only evaluated for human receptors. Use of contaminated groundwater for crops or livestock is assumed not to occur.

**Comment:** Assuming groundwater will not be used for irrigation or livestock places unreasonable restrictions on future use of the land by the Yakama Nation and therefore presents an incomplete assessment of risk from exposure to the groundwater contaminants. Groundwater use for irrigation and livestock should be evaluated and incorporated into an inter-related ecological/human health risk assessment.

10. **Page 6-33:** The risk assessment for soils under the 500-year drilling scenario assumes that, as contaminated soil is brought to the surface, it is spread out over the site. This results in a 1,000-fold dilution of the contaminant concentration.

**Comment:** It is not agreed that this is a reasonable assumption for determining potential future risk from exposure to contaminated soils. The highest exposure would occur during handling as the soil is removed from the ground. This is before it could be spread out over the land and subsequently diluted. The ecological impact of this scenario and its inter-relationship with human effects should also assume exposure to the drill cuttings prior to any dilution. Soil concentration limits for waste accepted at the ERDF should therefore be much lower than what is presented in Appendix C.

11. **Risk Assessment:** The risk assessment is considered short-sited and incomplete in that it 1) assesses only the carcinogenic and non-carcinogenic effects from exposure to the contaminants on a single most-exposed individual and ignores effects on the overall population; 2) focuses only on the effects of contaminant exposure on an individual of this generation and ignores other effects, such as bioaccumulation and mutagenesis, that may affect future generations; 3) ignores bioaccumulation and mutagenic effects within and upward through the food chain and; 4) does not consider additive risks from contaminants already in the underlying groundwater system. Also, as discussed above, the risk assessment should have included many more contaminants of concern based on a worst-case irrigation-use future scenario of the land.

12. **Page 7-21:** The first remedial action objective specified for the ERDF site is to support the removal of contaminants from portions of the Hanford Site (including near the Columbia River) in a timely manner.

**Comment:** While it is stated in the document that the ERDF is proposed to support this objective, other means such as recycling and treatment of the remediation wastes with deep geologic disposal would result in greater long-term protection of human health and the environment at Hanford, while releasing remediated areas to other productive uses. These other means can incorporate best available technologies that can be implemented in a timely manner. They would also prevent contamination of yet another area of the Hanford Site by improper waste disposal practices. The melter/slagger process which is in commercial use at Oak Ridge is an example of a technology that could be used to reduce the volume and mobility of radioactive wastes. Calcining would reduce the toxicity, mobility and volume of chemical wastes.

13. **Page 7-21:** Other remedial action objectives for the ERDF site include preventing unacceptable direct exposure to waste, preventing unacceptable contaminant releases to air, preventing contaminant releases to groundwater above ARARs and risk-based criteria, and minimizing ecological impacts.

**Comment:** The ERDF site does not meet any of these objectives. Risk from direct exposure to the waste would be significantly increased through use of the ERDF because of the multiple handling procedures involved in excavation and disposal of the material as well as associated decontamination activities. Any treatment of the waste after disposal at the ERDF would require additional handling and therefore result in even more unnecessary exposure.

The potential for contaminant releases to the air would be increased through multiple handling scenarios and cross-site transportation of the waste materials. Dust suppressant materials would be considered unacceptable and unreliable to minimize or eliminate such potential dispersion. Disposal of the waste material in the ERDF would result in contamination of clean soil and the vadose zone beneath the facility as well as unacceptable

contamination of the underlying groundwater system. Extensive and possibly irreparable damage to the habitat and cultural and socioeconomic value of the area would result from construction of the ERDF site. Construction of the site would also result in an unacceptable situation of Hanford land being "sacrificed" as part of the overall cleanup effort.

> CERCLA guidance would indicate the ERDF does not provide an acceptable level of overall protection of human health and the environment based on long-term effectiveness and permanence of the facility. In addition, under CERCLA, EPA expects remedial alternatives to use treatment to reduce the toxicity, mobility and volume of the contaminants wherever possible. However, the very nature of, and justification for, the ERDF site would inhibit development of innovative technologies for treatment of contaminants at Hanford. As stated on page 9-28 of the document, the ERDF would result in alternatives involving excavation and disposal ranking higher in operable unit RI/FS documents versus alternatives that involve treatment mechanisms. The ERDF is therefore inconsistent with and precludes implementation of the Yakama Nation's expected final remedy for the Hanford Site and thereby violates section 300.430 (a)(ii)(B) of CERCLA.

14. **Page 8-4:** Permanent disposal of low-level mixed wastes from Hanford at an offsite facility or geologic repository is not retained based on poor short-term effectiveness, low implementability and high cost.

**Comment:** It is not agreed that offsite disposal of Hanford wastes should be eliminated from further consideration. Although significant volumes of waste material may be generated as part of remediation of the source and groundwater operable units, the driving force would be to identify and implement recycling and treatment technologies to minimize the final waste volume requiring disposal and reduce or eliminate its toxicity and mobility to render it safe for handling and offsite transportation. As previously stated, the ERDF does not encourage or anticipate the development of innovative actions and results in poor long-term planning for protecting human health and the environment. Therefore, when considered over the long-term with necessary institutional controls, it is likely the overall costs of the ERDF significantly out-weigh costs associated with systems-engineered treatment and potential off-site disposal in a permanent deep repository requiring no institutional controls.

Furthermore, it is not agreed that offsite disposal would present significantly greater short-term public risks versus an onsite waste management facility. Operation of the ERDF would result in a significant amount of handling of the untreated waste material and potential for dispersion over transportation routes to the facility. Decontamination activities also create an unnecessary potential for risk. Systems-engineered treatment facilities, such as calcining and the melter/slagger process at Oak

Ridge, would not only result in lower short-term risks by rendering the waste safer to handle and transport, but also satisfy the much larger goal of providing effective long-term protection and permanence. Also, given sound engineering practices, public opposition to offsite disposal would be minimized.

15. **Page 8-17:** Land use restrictions can include zoning and deed restrictions to limit future land use and activities.

**Comment:** Actions such as these portend unacceptable permanent restrictions on future use of the land by Yakama Nation people. Again, the long-term picture of Hanford and the release of land for unrestricted beneficial use is not being considered as an alternative by the Department of Energy. Such an alternative should be evaluated allowing detailed evaluation of impacts consistent with NEPA requirements.

16. **Page 8T-1a:** The ERDF, identified as a centralized engineered facility, is retained for further consideration. Engineered facilities at source operable unit sites are not retained.

**Comment:** The ERDF, while a centralized facility requiring engineering to construct, operate and close, is not a systems-engineered facility that will result in the long-term protection of human health and the environment. Systems-engineering is the only viable means of effectively and efficiently using available resources to remediate the Hanford Site in a manner that will result in the long-term protection of human health and the environment and the release of land for unrestricted beneficial use. By continuing to consider an ERDF and source operable unit systems, Department of Energy persists in ignoring this approach.

17. **Page 9-11:** A grout batch plant is a support facility for the ERDF.

**Comment:** Grouting is a short-term measure that does not provide for the long-term protection of human health and the environment. Grouting also increases the volume of waste material by a factor of 5, resulting in far more material that may require future treatment and disposal. Other technologies such as recycling, waste minimization, in-situ soil washing and other innovative waste treatment such as calcining, tritium recovery and the melter/slagger process at Oak Ridge should be evaluated as part of the systems-engineering approach to cleanup of the Hanford Site. As we have noted in the past relative to the proposal to use grout to immobilize a low-level stream of high-level radioactive waste in tanks at Hanford, we consider the dilution of wastes with grout and the resulting additional difficulty created to eventually retrieve and remediate the wastes in the future is unsatisfactory.

18. **Page 9-12:** It is estimated that 28.5 million cubic yards of remediation waste could be disposed of at the ERDF.

**Comment:** Although the ERDF has been designed for the containment of remediation wastes from the 100 and 300 Areas, the facility does not discuss what will be done with wastes from other operable units (source and groundwater) at the Hanford Site. Because of the large amount of waste across the site, recycling and volume reduction methods as part of the systems-engineering approach to cleanup must be considered to effectively and efficiently utilize existing resources to provide for the long-term and permanent protection of human health and the environment.

19. **Page 10-2:** The document states that it appears as though most of the waste will meet the acceptable soil concentrations for disposal at the ERDF. For the contaminants that may exceed acceptable levels (metals and radionuclides), no treatment technologies exist for reducing concentrations.

**Comment:** This statement lays out what appears to be the unacceptable criteria by which the ERDF would be operated and the impact of the ERDF on remediation strategies at the Hanford Site. The ERDF would become a disposal facility for any and all wastes regardless of contaminant concentrations, result in significant increases in the volumes of waste being disposed or requiring future treatment and disposal (in violation of DOE Order 5820.2A), and inhibit the development of recycling and innovative technologies, such as calcining, the melter/slagger process at Oak Ridge or in-situ soil washing, to render the contaminants less available to potential receptors to distroy contaminants or to reduce their volume.

Although the Department of Energy is pushing the need for the ERDF behind the guise that other areas could then be remediated and released for other beneficial uses, the long-term result will be that the ERDF will be a "sacrificed" area and a permanent source of potential ecological and human risk through release of contamination via various exposure pathways. This represents an unacceptable danger and liability to future generations.

20. **Page C-2:** Leachate concentration limits for the ERDF were back-calculated using target groundwater concentrations resulting in an HQ of 1 and an ICR of $1 \times 10^{-5}$ via ingestion and inhalation pathways. However, acceptable soil concentration limits corresponding to the calculated leachate limits were not determined, because of uncertainties in the waste release calculations.

**Comment:** It is unclear why acceptable soil concentration limits could not be determined from the acceptable leachate concentration values. This is the reverse of the calculations used in the base conditions model. Therefore, the same mechanisms and input parameters should apply.

Also, it is unclear what is meant on Page A-9 where it states for the base conditions model "... it was assumed that the waste would not generate leachate concentrations that exceeded the

acceptable leachate limits ... by ensuring that the input solubility did not exceed the leachate limits." This appears to indicate contaminant solubility parameters were manipulated in such a way that, regardless of contaminant concentrations in soil disposed of at the site, the resultant leachate concentrations would not result in a groundwater risk with an HQ greater than 1 or an ICR greater than $1 \times 10^{-5}$.