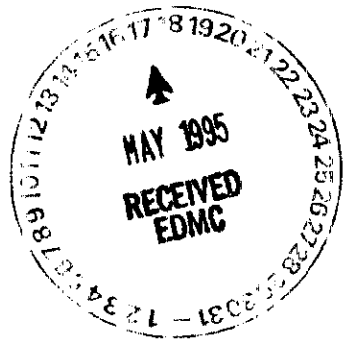
Confederated Tribes and Bands
of the Yakama Indian Nation

Established by the
Treaty of June 9, 1855



May 9, 1995

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

Dear Mr. Wagoner:

Subject: HANFORD 100-KR-2, 200-BP-1 AND 300 AREA PROCESS TRENCHES; COMMENTS ON REMEDIAL ACTIONS BEING PLANNED BY DOE/RL--

We have previously commented on remedial plans for all areas at Hanford. Comments concerning design criteria for these remediation activities are contained in these previous comments. They include proposed actions to address the following issue:

ISSUE: The standards for remediation and for waste disposal facilities at Hanford, including the subject facilities, do not explicitly include the requirement of providing for general (unrestricted) usage of the land and groundwater at 100 years (or sooner) from the decommissioning of waste management facilities and closure of waste disposal areas or completion of remediation activities. The Yakama Nation considers such a criteria, being consistent with the commercial standard for low-level radioactive waste, is the standard that should be invoked at Hanford.

BACKGROUND: Planning to make Hanford's Central Plateau in the vicinity of the 200 Area a sacrifice zone, permanently contaminated with radioactive and hazardous materials, has long been a defacto criteria driving waste management and remediation decisions of Government and Contractor managers. However, this demise for the natural resources and cultural resources in this area has not been agreed to by many entities having an interest in Hanford. In particular the Yakama Indian Nation that retains reserved rights to the area, as guaranteed by the Treaty of 1855, considers planning that would condemn the land permanently does not take into account Treaty provisions. These Treaty rights pertain to hunting, gathering foods and medicines and pasturing stock on open unclaimed portions of ceded lands, which include the 200 Areas and other areas at Hanford

In addition the costs associated with long term management, assuming the existence of institutional controls, constitute an unwarranted burden on future generations. Actions by future generations to provide tax dollars for effective management should not be assumed.

Rules for disposal of low-level radioactive wastes, for example those that apply to the commercial disposal facility on State leased land near the 200 Areas, if properly observed, are intended to assure that the condition described in the ISSUE above, i.e., the general "unrestricted" use of the land and resources by people in the future. The concept of a permanent "sacrifice zone" is not embodied in these rules.

Requirements specified by the Nuclear Regulatory Commission in 10 CFR 61.51 (a)(1) provide that "Site design features must be directed toward long-term isolation and avoidance of the need for continuing active maintenance after site closure." At 10 CFR 61.42 it is required that "Design operation and closure of the land disposal facility must ensure protection of any individual inadvertently intruding into the disposal site and occupying the site or contracting the waste at any time after active institutional controls over the disposal site are removed."

In addition, at 10 CFR 61.59 (b) the rules state that, "The period of institutional controls will be determined by the Commission, but institutional controls may not be relied upon for more than 100 years following transfer of control of the disposal site to the owner."

Finally, another rule at 10 CFR 61.7 (B)(5) provides for the use of special engineered barriers to avoid exposure to an "intruder[1]." This rule specifies, "The effective life of these 'intruder barriers' should be 500 years. A maximum concentration of radionuclides is specified for all wastes so that at the end of the 500 year period, remaining radioactivity will be at a level that does not pose an unacceptable hazard to an **intruder** (emphasis added) or public health and safety. Waste with concentrations above these limits is generally unacceptable for near surface disposal."

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[1]Intruder in this context covers any intruder into the waste. It extends beyond the term "inadvertent intruder" which is a defined term in the rules. That definition is, "Inadvertent intruder means a person who might occupy the disposal site after closure and engage in normal activities, such as agriculture, dwelling construction, or other pursuits in which the person might be unknowingly exposed to radiation from the waste." Yakama Nation people would fall into either category as "inadvertent intruders" in pursuing rights under the Treaty of 1855 or as "intruders" intent on scavenging materials left in disposal facilities.

However, these rules do not address the integrity of the ecological system in the 200 Area and other aspects of the environment that do not directly affect the health of human intruders, including "inadvertent intruders."

The Department of Energy should invoke the rules applicable to commercial disposal of low-level radioactive wastes equally to disposal of defense low-level radioactive wastes. In addition, an equivalent standard for disposal of hazardous wastes and mixed wastes is required. The superior standard addressing the long-term effects of the disposal of radioactive wastes would be of only limited benefit to future residents of the site, if chemically hazardous wastes, including mixed wastes were disposed in facilities without equivalent long-term design standards. In this regard the current planning reflecting the need for institutional controls far into the future to protect people and resources from hazardous wastes is problematic and unacceptable to the Yakama Nation.

The Hanford Future Site Uses Working Group considered the long-term impacts associated with disposal facilities and residual contamination left over from remediation efforts. They stated:

> "Following completion of waste management activities, the Working Group desires that the Central Plateau be suitable for other general uses 100 years from decommissioning of waste management facilities and closure of waste disposal areas."

The Working Group went on to say that they believed, "...that both cleanup and future development decisions should be guided by the principle, that actions taken to remediate or to accomplish waste management do no harm."

With respect to ground water the Working Group stated that "However, as technology advances, and over time, the Working Group expects groundwater to ultimately be returned to "unrestricted" status."

YAKAMA NATION POSITION ON COMPLIANCE/REGULATION AT HANFORD CONSIDERING THE SUBJECT FACILITIES:

1. Modify pertinent DOE orders to specify design requirements for all disposal facilities and remediation areas that shall allow unrestricted access by "inadvertent intruders" to the disposal facilities or areas to be remediated, including those 100, 200 AND 300 Areas at Hanford, at 100 years past the closure of the respective disposal facilities or remediated area.

2. Establish the requirement that institutional controls shall not be utilized to protect public health and safety and the environment beyond 100 years of waste disposal site closure or remediated area.

3. Establish the design requirement that an engineered barrier shall not be relied upon to protect public health and safety or the environment, considering possible actions of intruders or natural events, beyond 500 years from the construction of the barrier for waste disposal facilities or areas to be remediated.

4. Establish requirements to base disposal and remediation actions on performance analyses that include scenarios reflecting actions of future generations who may use the site, including scenarios approved by the Yakama Nation, reflecting Indian usage in the future.

Additional detailed comments concerning the subject facilities are contained in the Attachment to this letter.

Sincerely,

Barbara Maxwell

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

ATTACHMENT A: Detailed comments on HANFORD 100-KR-2, 200-BP-1 AND 300 AREA PROCESS TRENCHES

cc: K. Clarke, DOE/RL
L. McClain, DOE/RL
M. Riveland, WA Ecol.
C. Clarke, U.S. EPA Reg. 10
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RECORD PAGE FOR LETTER

May 9, 1995

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

Dear Mr. Wagoner:

Subject: HANFORD 100-KR-2, 200-BP-1 AND 300 AREA PROCESS TRENCHES; COMMENTS ON REMEDIAL ACTIONS BEING PLANNED BY DOE/RL--

YIN-CC:

M. Dick Squeochs, YIN
Carroll Palmer, YIN
F. Cook
B. Barry
Augustine Howard, YIN
Enviros

CONCURRENCE:

1. This letter was prepared by F. Cook.
2. This letter contains comments from ENVIROS forwarded to ER/WM Richland on February 16, 1995.

ATTACHMENT A: Detailed comments on HANFORD 100-KR-2, 200-BP-1 AND 300 AREA PROCESS TRENCHES

A. Review of the *Approach and Plan for Cleanup Actions in the 100-KR-2 Operable Unit of the Hanford Site*. DOE/RL-94-151. Decisional Draft.

- The Focus Package is insufficient in that it does not include any discussion of existing site data or identified data gaps. Therefore, as written, there is insufficient information to assess whether proposed investigatory actions, such as ground penetrating radar, are appropriate or sufficient to adequately characterize the areas to ultimately determine cleanup actions. The entire expedited schedule leading to an Interim Action Record of Decision then becomes questionable (see comment number 1).

  The Focus Package does not take into consideration the systems-engineering approach to effectively and efficiently utilize 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 in a timely manner for unrestricted beneficial use by Native Americans. For example, it is not agreed that low-priority sites should be deferred until final disposition of the entire 100-K Area. Many low-priority sites such as 130-KW-1 could be cleaned up as part of remediation of proximal higher-priority areas. Other combined cleanups of low- and high-priority areas within the 100-KR-2 Operable Unit may also be feasible and should therefore be identified. Under the *Hanford Federal Facility Agreement and Consent Order Action Plan* (Sections 3.3, 5.5 and Appendix C), such integration is required to ensure that activities remain physically consistent and to ensure that unit contamination is most economically and efficiently addressed by preventing overlap and duplication of work (see comment numbers 2 and 3)

1. **Page 1:** The purpose of this Focus Package is to describe a new approach and activities needed to reach a decision on cleanup actions for waste sites in the 100-KR-2 Operable Unit.

   Comment: The purpose of a Work Plan is to present existing data and identify data gaps needing to be filled as part of characterization of the site. The Work Plan should also describe where and how these data points will be collected. The Limited Field Investigation then becomes an implementation of the Work Plan whose results are used in the preparation of the risk assessment and feasibility study documents and in the preparation of a proposed plan for cleanup of the area.

   Although this Focus Package is intended to be a summary of information typically included in a Work Plan, it is

insufficient in that it does not include any discussion of existing site data or identified data gaps. Therefore, as written, there is insufficient information to assess whether proposed investigatory actions, such as ground penetrating radar, are appropriate or sufficient to adequately characterize the areas to ultimately determine cleanup actions. The entire expedited schedule leading to an Interim Action Record of Decision then becomes questionable.

2. **Page 2:** Cleanup of the KE and KW reactors within the 100-KR-2 Operable Unit are being addressed under the separate reactor decommissioning program. This includes the K-Basins (Table 1, page 9 and Table 2, page 15)

   Comment: It is not agreed that activities needed to reach a decision on cleanup actions can be adequately identified or proposed without considering inclusion of the K-Basins. In accordance with the systems-engineering approach to effectively and efficiently utilize 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 in a timely manner for unrestricted beneficial use by Native Americans, proximate source operable areas should be considered concurrently in the overall cleanup strategy for any area of the Hanford Site. Under the *Hanford Federal Facility Agreement and Consent Order Action Plan* (Sections 3.3, 5.5 and Appendix C), such integration is required to ensure that activities remain physically consistent and to ensure that unit contamination is most economically and efficiently addressed by preventing overlap and duplication of work.

3. **Page 3:** Table 1 lists low-priority sites for which action is deferred to the final stage of cleanup actions for the 100-K Area.

   Comment: It is not agreed that low-priority sites should be deferred until final disposition of the entire 100-K Area. As stated above in Comment 2, in order to effectively and efficiently utilize existing resources under the systems-engineering approach, many low-priority sites can be cleaned up as part of remediation of higher-priority areas. For example, because of their proximity and likelihood for intermixing of contaminants, it is possible that cleanup of the 130-KW-1 area (low-priority) could be conducted during remediation of the 116-KW-1 and 5.38 areas (high-priority). Other combined cleanups of low- and high-priority areas within the 100-KR-2 Operable Unit may also be feasible and should therefore be identified. Such integration is required under the *Hanford Federal Facility Agreement and Consent Order Action Plan* (Sections 3.3, 5.5 and Appendix C).

4. **Table 1, Pages 9-13:** An investigation approach is listed as not being required for several areas within the 100-KR-2 Operable Unit.

Comment: It should be clarified whether sufficient information already exists for characterization of these areas or if additional data should be collected under the subsequent Limited Field Investigation.

B: Review of the Hanford *200-BP-1 Operable Unit Proposed Plan.*

The concentration of radioactive contaminants beneath the 200-BP-1 Area increases with depth. Highly-mobile radioactive and non-radioactive contaminants have already reached the underlying groundwater system and have migrated more than a mile north of the 200-BP-1 Area. Groundwater is approximately 230 feet below ground surface. Groundwater contamination is being addressed in the 200-BP-5 Operable Unit. The following comments are pertinent.

- Identification and consideration of surface barriers, on-site land filling, institutional controls and use of materials from the basalt outcroppings or McGee Ranch as part of long-term interim or final remedial measures for cleanup of the 200-BP-1 Operable Unit place unacceptable restrictions on future beneficial use of the land, provide little consideration of the cultural and religious values placed on areas by the Native Americans, require an unacceptable, irreversible and irretrievable commitment of resources, are inconsistent with and preclude implementation of the expected solution for cleanup of the Hanford Site and therefore violate section 40 CFR300.430 (a)(1i)(B) of CERCLA regulations, and do not recognize systems-engineering as a viable means of effectively and efficiently utilizing available resources (see comment numbers 2, 6, 7 and 8).

- Information presented in the document indicates that a plume of contamination exists between 15 and 50 feet below ground surface and that highly mobile contaminants are still present in the soil column below 50 feet. While current groundwater contaminant concentrations may not be as elevated as historical levels, this plume as well as the deeper contaminants will continue to act as a future source of groundwater contamination. Depending on future use of the land, such as a potential worst-case irrigation-use scenario, this source could result in increasing groundwater contaminant concentrations (see comment number 3).

- Although this summary document does not detail the scenario by which exposure to subsurface soils and groundwater could occur, it is assumed the scenarios are similar to those used in the Hanford *Remedial Investigation and Feasibility Study Report for the Environmental Restoration Disposal Facility* (ERDF) (DOE/RL-93-99, Revision 1). As a result, risk from exposure to soils from the 200-BP-1 Operable Unit should be higher than what is reported in this summary document. Also, the groundwater scenario should have resulted in higher groundwater contaminant concentrations, faster travel times to the site boundary and, therefore, more

contaminants of potential concern being retained for further consideration in the risk assessment. Groundwater use for irrigation and livestock should also have been evaluated with this data incorporated into an inter-related ecological/human health risk assessment.

Also, as with the ERDF document, it is likely the risk assessment for the 200-BP-1 Operable Unit is short-sighted 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 bio-accumulation and mutagenesis, that may affect future generations; 3) ignores bio-accumulation and mutagenic effects within and upward through the food chain; 4) assumes human health screening values are also appropriate for ecological receptors and; 5) does not consider additive risks from contaminants already in the underlying groundwater system.

Comments such as these, related to the usefulness of applied risk assessment methodologies, will continue until appropriate land use and exposure scenarios have been negotiated and agreed to with representatives from Native American Nations (see comment number 4).

- The proposed plan for the 200-BP-1 Operable Unit does not meet any of its remedial action objectives. Risk due to exposure from soils could exceed specified ranges under more-appropriate exposure scenarios. Limiting biotic intrusion places unacceptable restrictions on future use of the land by Native Americans and their future generations. Groundwater would continue to be impacted under more-appropriate fate and transport modeling scenarios and would result in unacceptable human health and ecological risk (see comment number 5).

  The preferred alternative (Alternative D: Modified RCRA Barrier) may not be in compliance with all identified ARARs. This alternative does nothing to remediate existing soil contamination. This soil will continue to be a source of groundwater contamination and therefore pose continual, unacceptable risks to future generations of Native Americans as well as the food-chain resources on which they rely. Furthermore, selection of this alternative is inconsistent with, and precludes, implementation of the expected solution for cleanup of the Hanford Site and is therefore in violation of 40 CFR 300.430 (a)(ii)(B) of CERCLA regulations (see comment number 16).

Justification for the preferred alternative is based on the statement that it will not create additional waste site(s). It is unclear how DOE can then justify the Environmental Restoration Disposal Facility as it would result in the contamination of the underlying clean soil column and vadose zone (see comment number 17).

Justification for the preferred alternative is based on the statement that since the contaminated soils must remain on the Hanford Site for the foreseeable future regardless of the alternative chosen, and the most significant contamination is located from 15 to 50 feet below the ground surface, it makes sense to leave the waste in place at this operable unit. This statement is very short-sighted and inhibits recycling efforts and the identification and development of systems-engineered technologies within DOE and its contractors for cleanup of the Hanford Site. This statement also ignores the Native American's expected final remedy of the Hanford Site and the return of the land for unrestricted and beneficial traditional and cultural use (see comment number 18).

- The proposed plan fails to integrate potential closure and remedial activities with other adjacent units such as the BY Tank Farm. In accordance with the systems-engineering approach, similar and/or adjacent facilities should be considered jointly when possible in order to effectively and efficiently utilize available resources for cleanup of the entire Hanford Site and the expedited release of current and future areas for other beneficial use. Under the *Hanford Federal Facility Agreement and Consent Order Action Plan* (Sections 3.3, 5.5 and Appendix C), such integration is required to ensure that activities remain physically consistent and to ensure that unit contamination is most economically and efficiently addressed by preventing overlap and duplication of work (see comment numbers 5 and 19).

1. **Early Site Work:** Contaminated surface soils associated with unplanned releases in the 200-BP-1 Area have been moved and consolidated over the top of the cribs where they have been covered with approximately 2 feet of clean soil to reduce contaminant migration and exposure.

Comment: It is not agreed that 2 feet of clean soil cover can be so pointedly stated as a means by which contaminant migration and exposure is reduced. The addition of a cover can actually increase contaminant mobility because it may have resulted in the elimination of site vegetation that originally aided in reducing water infiltration through the soil column.

Also, unless this cover is composed of a highly impermeable material, it is unlikely to have any significant impact on reducing contaminant mobility and therefore exposure through the groundwater pathway. Two feet of soil cover is also not likely to provide noticeable protection from surface or airborne exposure because it is not thick enough to prevent bare spots from arising due to erosion (water and air). It may be more correct, and therefore it is recommended here, to eliminate any reference of this minimal soil cover with the protection of human health and the environment.

2. **Early Site Work:** A prototype surface barrier (Hanford Barrier) is being constructed over the 216-B-57 crib and will be the first full-scale model. Efforts to design a barrier that will last for over 1,000 years has been ongoing over the last 10 years. This test is being performed to gather construction and performance data so that these barriers can be used more extensively on the Hanford Site as well as other semi-arid environments.

Comment: Use of surface barriers as long-term interim or final remedial measures is not consistent with, and precludes, implementation of the Native American's expected solution for cleanup of the Hanford Site and expedited return of the land for unrestricted and beneficial traditional and cultural use. These barriers, as well as other proposed activities that do not consider Native American values, are therefore in violation of 40 CFR 300.430 (a)(ii)(B) of CERCLA regulations.

3. **Extent of Contamination:** Below the 2 feet of clean soil cover, the near-surface soils (2 to 15 feet) contain low levels of radionuclides. Contaminated soils between 15 and 50 feet below ground surface contain much higher levels of radionuclides than the upper and lower soils. Contaminants of concern present in soils below 50 feet include Nitrate, Cobalt-60, Technetium-99 and Uranium. Nitrate, Cobalt-60 and Technetium-99 are highly mobile and reached groundwater very soon after being discharged to the cribs. Contaminant concentrations currently entering groundwater from soils at 200-BP-1 are declining and are generally near or below EPA's drinking water standards.

Comment: It is not agreed that an overall statement can be made that contaminant concentrations entering the groundwater from the 200-BP-1 Operable Unit are declining. Information presented in the document indicates that a plume of contamination exists between 15 and 50 feet below ground surface and that highly mobile contaminants are still present in the soil column below 50 feet. While current groundwater contaminant concentrations may not be as elevated as historical levels, this plume as well as the deeper contaminants will continue to act as a future source of

groundwater contamination. Depending on future use of the land, such as a potential worst-case irrigation-use scenario, this source could result in increasing groundwater contaminant concentrations.

4. **Summary of Site Risks:** State and federal guidelines for acceptable cancer risks normally range from $1x10^{-4}$ to $1x10^{-6}$ due to exposure to a carcinogen. Under the baseline risk assessment, the total lifetime cancer risk associated with exposure to soils located from 2 to 15 feet below the ground surface, if exposed to the surface, is $9x10^{-5}$. If the higher contaminated soils (from 15 to 50 feet below ground surface) become exposed at the ground surface, they will pose an unacceptable risk (greater than $1x10^{-2}$).

Uranium is relatively mobile and extremely long-lived and poses the most significant future risk through the groundwater pathway. Modeling indicates that if no action was taken to remediate the contaminated soils, natural precipitation (rain and snow) will transport Uranium into the underlying groundwater system. Uranium concentrations will exceed drinking water standards in about 700 years.

Comment: Although this summary document does not detail the scenario by which exposure to subsurface soils and groundwater could occur, it is assumed the scenarios are similar to those used in the Hanford *Remedial Investigation and Feasibility Study Report for the Environmental Restoration Disposal Facility* (ERDF) (DOE/RL-93-99, Revision 1). For the ERDF: a) contaminated soils would be brought to the surface as a result of drilling (500-year drilling scenario). Risk from exposure to the contaminated soils was determined assuming the soils are diluted 1,000-fold as a result of being spread out over the site (mixed with cleaner soils); b) for the groundwater scenario, infiltration rates were assumed to be approximately an order of magnitude higher than what would be expected under current climatic conditions; c) use of contaminated groundwater was only evaluated for human receptors. Use of contaminated groundwater for crops or livestock was assumed not to occur; and d) it was assumed that the contaminants of greatest concern from an ecological perspective would be identified with a human health risk-based screening process.

As stated in comments to the ERDF and other Hanford documents and as re-stated below, risk assessment calculations using these scenarios and assumptions are not reasonable.

a) The highest exposure to soil contaminants 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. Risk from exposure to soils from the 200-BP-1 Operable Unit should therefore be higher than what is

reported in this summary document. 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.

b) The base condition model for the 200-BP-1 Operable Unit appears from the summary document to assume natural precipitation as the driver of contaminants through the soil column into the underlying groundwater system. In addition to the problem of DOE's inconsistent use of standard fate and transport models among different operable units at the Hanford Site, or at least between the ERDF site and 200-BP-1 Operable Unit, the base condition model should assume an irrigation-use scenario as a possible worst-case situation. Such a future scenario is possible as part of traditional and cultural Native American use of the land (unrestricted use). For the 200-BP-1 Operable Unit, as with the ERDF site, this scenario would result in higher groundwater contaminant concentrations, faster travel times to the site boundary and, therefore, more contaminants of potential concern being retained for further consideration in the risk assessment.

c) Assuming groundwater will not be used for irrigation or livestock places unreasonable restrictions on future use of the land by Native Americans 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.

d) Without supporting facts, it is not agreed that human health screening values are also appropriate for ecological receptors. In addition, cumulative effects of exposure on the food chain cycle should be considered as well as how these exposures may ultimately effect human health and the religious, cultural and socioeconomic values placed on the land and its resources by Native American people and their future generations.

Finally, as with the ERDF document, it is likely the risk assessment for the 200-BP-1 Operable Unit is short-sighted 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 bio-accumulation and mutagenesis, that may affect future generations; 3) ignores bio-accumulation 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.

Comments such as these, related to the usefulness of applied risk assessment methodologies, will continue until appropriate exposure scenarios have been agreed to with representatives from Native American Nations.

5. **Scope and Role of Action:** Remedial action objectives for the 200-BP-1 Operable Unit include limiting risk from exposure to soils at $1x10^{-4}$ to $1x10^{-6}$ or less; limiting biotic (plant and animal) intrusion that could result in exposing contaminants to the surface; limiting future impacts to the groundwater; and accounting for the proximity of the 241-BY Tank Farm when evaluating the remedial alternatives and selecting a preferred remedy.

Comment: The proposed plan for the 200-BP-1 Operable Unit does not meet any of these remedial action objectives. Risk due to exposure from soils could exceed specified ranges under more-appropriate exposure scenarios (see Comment 4). Limiting biotic intrusion places unacceptable restrictions on future use of the land by Native Americans and their future generations. Groundwater would continue to be impacted under more-appropriate fate and transport modeling scenarios and would result in unacceptable human health and ecological risk (see Comments 3 and 4).

Also, the proximity of the BY Tank Farm, or other adjacent facilities, should not be considered a deterrent to implementation of the appropriate remedial measure at the 200-BP-1 Operable Unit. In accordance with the systems-engineering approach, similar and/or adjacent facilities should be considered jointly, as possible, in order to effectively and efficiently utilize available resources for cleanup of the entire Hanford Site and the expedited release of current and future areas for other beneficial use. Under the *Hanford Federal Facility Agreement and Consent Order Action Plan* (Sections 3.3 5.5 and Appendix C), such integration is required to ensure that activities remain physically consistent and to ensure that unit contamination is most economically and efficiently addressed by preventing overlap and duplication of work (see also Comment 19).

6. **Summary of Alternatives:** All waste removed from this operable unit would be placed in a permanent landfill on the Hanford Site. This landfill is presently in the conceptual design stage. All waste disposed at the landfill must meet a waste acceptance criteria.

Comment: It is not agreed that on-site land filling of excavated waste from the 200-BP-1 Operable Unit should be considered as the only disposal option. Most treatment scenarios currently being proposed by DOE are not considered to be long-term approaches to reducing the toxicity, mobility

or volume of the contamination nor a means of providing for the long-term protection of human health and the environment. On-site land-filling therefore becomes an unacceptable scenario of relocating the problem and/or potentially delaying the impact of the contamination on future generations and food-chain resources.

Other means of waste disposal such as treatment with deep geologic disposal should be considered as they would result in greater long-term protection of human health and the environment and prevent yet another area of the Hanford Site from being contaminated as a result of improper or short-sighted waste disposal practices.

Although significant volumes of waste material may be generated as part of remediation of source and groundwater operable units at the Hanford Site, 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 off-site transportation. Treatment to achieve this disposal goal can incorporate best available technologies that can be implemented in a timely manner. The melter/slagger process being evaluated at Oak Ridge is an example of a technology that could be used to reduce the volume and mobility of radioactive wastes. Calcining or super critical CO_2 application are examples of technologies that could reduce the toxicity, mobility and volume of chemical wastes.

Systems-engineered treatment facilities such as these 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 off-site disposal would be minimized. Systems-engineering is a 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 expedited release of land for unrestricted beneficial use.

7. **Alternative B: Institutional Controls:** Institutional controls consist of fencing, warning markers and signs, site use restrictions and groundwater use restrictions. These controls are consistent with current plans for dedication of the 200 East Area as a waste management area.

Comment: Actions such as these place unacceptable restrictions on future use of the land by Native American people. The long-term picture of Hanford and the expedited

release of land for unrestricted beneficial use is not being considered by the Department of Energy.

8. **Alternative C: Bio-intrusion Barrier:** The barrier's primary functional layer is crushed basalt, which provides a physical barrier to burrowing animals and plant roots.

Comment: Although the summary report does not identify the source of this borrow material, as stated in the Hanford *Remedial Investigation and Feasibility Study Report for the Environmental Restoration Disposal Facility* (ERDF) (DOE/RL-93-99, Revision 1), this source is likely the basalt outcroppings or McGee Ranch. However, little consideration is given of the cultural and religious values placed on these areas by the Native Americans. As with the ERDF site, construction of barriers with material from these areas will require an unacceptable, irreversible and irretrievable commitment of resources.

9. **Alternative F: Excavation and Soil Washing:** The wash water used would be treated to meet waste acceptance criteria and disposed accordingly.

Comment: Supporting facilities such as these should be discussed in the summary report as they may have a significant impact on the long-term performance of the alternative as it relates to protection of human health and the environment. Significant volumes of wash water could be generated during operation of this alternative. Depending on the type of collection, treatment and disposal proposed, the volumetric flow rate of this stream has the potential to significantly impact long-term contaminant availability to human and ecological receptors and thus the subsequent evaluation of the facility.

10. **Overall Protection:** All alternatives, with the exception of the "No Action", "Institutional Controls" and possibly the "Bio-intrusion Barrier" alternatives, will provide adequate protection of human health and the environment by reducing or controlling the risk through engineering and institutional controls. All remaining alternatives provide long-term protection from direct contact exposure, plant and animal intrusion, and reduce water movement through the contaminated soils, thereby decreasing the potential for the contaminants to migrate to the groundwater.

Comment: It is not agreed that the remaining alternatives provide for the long-term protection of human health and the environment. Modeling and exposure scenarios as discussed in Comments 3 and 4 will greatly modify risk calculations and resulting risk values. Furthermore, these alternatives do not address existing soil contaminants which will continue to be

a source of groundwater contamination and unacceptable risk to human health and the environment.

Systems-engineering is a 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 expedited release of land for unrestricted beneficial use. DOE's continued consideration of non-systems-engineered approaches will likely be inconsistent with, and preclude, implementation of the Native American's expected solution for cleanup of the Hanford Site and will therefore be in violation of 40 CFR 300.430 (a)(ii)(B) of CERCLA regulations.

11. **Compliance with the ARARs:** All the remaining alternatives will comply with all applicable and appropriate federal and state environmental laws.

Comment: It is not agreed that the remaining alternatives will comply with all applicable and appropriate requirements. As stated above in Comment 5, the proposed plan for the 200-BP-1 Operable Unit does not meet any of its remedial action objectives. Risk due to exposure from soils could exceed specified ranges under more-appropriate exposure scenarios. Also, groundwater would continue to be impacted under more-appropriate fate and transport modeling scenarios and would result in unacceptable human health and ecological risk under more-appropriate future-use scenarios.

Furthermore, Alternative II: Excavation and Fixation, would result in an increase in total waste volume and therefore violate Chapters II and III of DOE Order 5820.2A. Relocation of the waste to an on-site landfill (Alternatives F, G and I) would result in the contamination of yet another area of the Hanford Site due to improper and short-sighted waste disposal practices and prevent the release of land for unrestricted beneficial use. These alternatives are inconsistent with, and preclude, implementation of the expected solution for cleanup of the Hanford Site and are therefore in violation of 40 CFR 300.430 (a)(ii)(B) of CERCLA regulations.

12. **Long-Term Effectiveness and Permanence:** All remaining alternatives will provide adequate long term protection of the groundwater, contact exposure, and plant and animal for the 200 to 1,000-year period of concern. This is accomplished through isolation of the contaminated soils and preventing migration of the contamination by reducing or eliminating infiltration of precipitation through the use of a barrier and/or vitrification or fixation.

Comment: It is not agreed that the remaining alternatives provide for the effective and permanent long-term protection

of human health and the environment. Modeling and exposure scenarios as stated above in Comments 3 and 4 will greatly modify risk calculations and resulting risk values. Furthermore, treatment technologies considered within this document are not considered long-term approaches. Systems-engineering is a 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 expedited release of land for unrestricted beneficial use.

13. **Reduction of Toxicity, Mobility, or Volume of the Contaminants through Treatment:** None of the alternatives under consideration reduces the toxicity of the contaminated soils, since radionuclides cannot be destroyed or transformed into a less hazardous substance. Only alternatives with soil washing are capable of reducing the volume of contaminated soils. All remaining alternatives will reduce the mobility of the contaminants in the soils, to varying degrees, through the use of a barrier to reduce or eliminate infiltration due to precipitation and/or vitrification or fixation.

Comment: It is not agreed that radionuclides cannot be transformed into a less hazardous substance. Oak Ridge's melter/slagger process has the potential for separating transuranic from low level wastes and would also render the waste form less mobile and therefore less toxic. Other technologies, such as calcining and super critical CO_2 application, can reduce the volume, toxicity and mobility of the contaminated waste. Alternatives considered for the 200-BP-1 Operable Unit are not considered long-term approaches for cleanup of the site.

14. **Short-Term Effectiveness:** All excavation alternatives result in a very high risk to the workers due to the high levels of radioactivity.

Comment: While worker safety is critical, it should not be the means by which alternatives are dismissed from further consideration. Technologies are available and in use to protect workers from radiation exposure.

15. **Implementation:** The barrier alternatives use materials located on the Hanford Site and is constructed with standard earth-moving equipment.

Comment: As discussed above in Comment 8, although the summary report does not identify the source of the borrow material, as stated in the Hanford *Remedial Investigation and Feasibility Study Report for the Environmental Restoration Disposal Facility* (ERDF) (DOE/RL-93-99, Revision 1), this source is likely the basalt outcroppings or McGee Ranch.

However, little consideration is given of the cultural and religious values placed on these areas by the Native Americans. As with the ERDF site, construction of barriers with materials from these areas will require an unacceptable, irreversible and irretrievable commitment of resources. The implementability of these types of alternatives should be considered "low"

16. **Summary of the Preferred Alternative:** The preferred alternative for the 200-BP-1 Operable Unit is Alternative D: "Modified RCRA Barrier". This alternative complies with all identified ARARs.

Comment: It is not agreed that this alternative may be in compliance with all identified ARARs. This alternative does nothing to remediate existing soil contamination. This soil will continue to be a source of groundwater contamination and therefore pose continual, unacceptable risks to future generations of Native Americans as well as the food chain resources on which they rely. Furthermore, selection of this alternative is inconsistent with, and precludes, implementation of the expected solution for cleanup of the Hanford Site and is therefore in violation of 40 CFR 300.430 (a)(ii)(B) of CERCLA regulations.

17. **Summary of the Preferred Alternative:** Alternative D will utilize a final solution without further spreading contamination or creating additional waste site(s) or increasing risks due to implementation of the alternative.

Comment: It is not agreed that this alternative should be considered a final solution for remediation of the 200-BP-1 Operable Unit, nor should it be considered a means to prevent further spreading of contamination from the site as it does nothing to remediate existing contaminants in the soil column.

Furthermore, it is interesting to note here that justification for this alternative is based on the statement that it will not create additional waste site(s). How, then, can DOE justify the Environmental Restoration Disposal Facility as it would result in the contamination of the underlying clean soil column and vadose zone?

18. **Summary of the Preferred Alternative:** Since the contaminated soils must remain on the Hanford Site for the foreseeable future regardless of the alternative chosen, and the most significant contamination is located from 15 to 50 feet below the ground surface, it makes sense to leave the waste in place at this operable unit.

Comment: This statement is very short-sighted and inhibits recycling efforts and the identification and development of

systems-engineered technologies within DOE and its contractors for cleanup of the Hanford Site. This statement also ignores the Native American's expected final remedy of the Hanford Site and the return of the land for unrestricted and beneficial traditional and cultural use.

19. **Summary of the Preferred Alternative:** EPA, Ecology and DOE recognize the risk associated with placement of a barrier at the 200-BP-1 Operable Unit due to future remediation of the adjacent BY Tank Farm. However, all parties have agreed to work closely in the future to ensure remediation of the BY Tank Farm does not adversely affect remediation activities for the 200-BP-1 Operable Unit.

Comment: As discussed above in Comment 5, the proximity of the BY Tank Farm, or other adjacent facilities, should not be considered a deterrent to implementation of the appropriate remedial measure at the 200-BP-1 Operable Unit. In accordance with the systems-engineering approach, similar and/or adjacent facilities should be considered jointly, as possible, in order to effectively and efficiently utilize available resources for cleanup of the entire Hanford Site and the expedited release of current and future areas for other beneficial use. Under the *Hanford Federal Facility Agreement and Consent Order Action Plan* (Sections 3.3, 5.5 and Appendix C), such integration is required to ensure that activities remain physically consistent and to ensure that unit contamination is most economically and efficiently addressed by preventing overlap and duplication of work.

C. Review of the Hanford *300 Area Process Trenches Closure Plan*. DOE/RL-93-73, Revision 0.

This document to which the following comments apply consists of a RCRA Part A Dangerous Waste Permit Application (Form 3), a RCRA TSD closure plan and a SEPA environmental checklist.

The 300 Area Process Trenches RCRA TSD unit is located within the boundaries of the 300-FF-1 CERCLA Operable Unit. As such, preparation of the Hanford *300 Area Process Trenches Closure Plan*, which relies heavily on data and documentation produced from previous CERCLA work in the 300-FF-1 Operable Unit as well as data from previous characterization work as part of an interim removal action in the process trenches, is unique in that it has been coordinated with preparation of the *Phase III Feasibility Study Report for the 300-FF-1 Operable Unit*.

This integration between RCRA and CERCLA is necessary to ensure that activities at the two units remain physically consistent in accordance with the *Hanford Federal Facility Agreement and Consent Order Action Plan* (Sections 3.3, 5.5 and Appendix C) so that unit contamination is most economically and efficiently addressed by preventing overlap and duplication of work. The Record of Decision for the 300-FF-1 Operable Unit will therefore reflect regulator decisions regarding remediation methodology and cleanup levels for the CERCLA operable unit and the RCRA ISD unit.

The 300 Area Process Trenches are located approximately 1,000 feet west of the Columbia River and were constructed and began operation in 1975 as the 316-5 Process Trenches. The area consists of two, parallel, unlined north-south trending trenches which are separated by an earthen berm. The east trench is approximately 1,200 feet and the west trench is approximately 1 130 feet in length. Both trenches are approximately 11 feet deep, 10 feet wide at the bottom and 32 feet wide at the top. The bottoms of the trenches slope gently to the north and are approximately 11 feet above the unconfined water table. Groundwater flow direction in the unconfined aquifer is predominantly to the southeast toward the Columbia River.

The 300 Area Process Trenches received non-regulated process cooling water from operations in the 300 Area of the Hanford Site as well as dangerous waste from several research and development laboratories and from the fuels fabrication process. Effluent entered the facility through a concrete weir box located at the south end of the TSD unit. The trenches were designed to percolate up to 3,000,000 gallons of waste water per day. This process design capacity reflects the maximum volume of water discharged daily rather than the physical capacity of the unit. This quantity also reflects total flow to the process trenches and not a total volume of dangerous waste discharged to the unit. Accurate records

of dangerous waste volumes discharged to the trenches are not available.

An ERA was undertaken in 1991 because of regulator concerns of the presence of radioactive and inorganic contaminants (primarily heavy metals) at levels potentially harmful to groundwater and to the nearby Columbia River. The objective of the ERA was to reduce the potential migration of contaminants to groundwater and reduce the measurable level of radiation in the trenches to less than 3 times the upper tolerance limit of background. This was accomplished by removing approximately 7,000 cubic yards of contaminated sediments from the sides and bottom of each trench and stockpiling them (the spoils) according to radiation levels. Sediments with radiation counts of less than 2,000 per minute were stockpiled at the north end of the trenches (spoils area). Sediments with radiation counts greater than 2,000 per minute were stockpiled in a depression located at the northwest corner of the west trench. Sediments in the depression area were then covered with a plastic barrier and a layer of clean aggregate.

The 300 Area Process Trenches remain in operation today as a surface impoundment for the disposal of process sewer effluent originating from various operations within the 300-FF-1 Area. This effluent, approximately 500,000 gallons per day, has been the sole source of effluent for the TSD unit since approximately 1987. Since 1985, the unit has been administratively closed to discharges of dangerous waste.

Provided below are Eco Compliance Corporation's specific comments to the subject document as they relate to the technical and regulatory adequacy and interests and values of the Yakama Nation. These comments follow the page and section numbering system as provided in the document. In summary, these comments indicate:

- The ROD for the 300-FF-1 Operable Unit will not be available until after submittal of this closure plan. Consequently, final closure specifications (e.g. cleanup levels and remediation technology) are not as yet known to the closure process. As written then, this document is little more than a Work Plan for preparation of the closure report (see comment number 10).

  HSBRAM methodology and industrial use of Hanford land continues to be specified as criteria by which chemical and radiological contaminants of concern are determined in soil and groundwater. HSBRAM is considered to be inadequate in many areas including the calculation of risk from exposure to contaminated soils (500-year drilling scenario), assumed infiltration rates for the groundwater fate and transport model, assumed groundwater use, and the identification of ecological contaminants of concern using a human health-based screening process. Appropriate and mutually-agreed upon land

use and exposure scenarios must be determined for use in site risk assessments before any contaminants of concern or cleanup or closure actions can be agreed to (see comment numbers 3, 7, 9, 11 and 12 related to the closure plan document and comment numbers 16, 17, 20 and 21 related to the associated SEPA Checklist).

DOE continues to propose disposal of remediation wastes at the Environmental Restoration Disposal Facility. However, justifications for cleanup among different areas of the Hanford Site are inconsistent. For example, DOE's justification of a preferred alternative for remediation of the 200-BP-1 Operable Unit is based on the statement that it will not create additional waste site(s) (see comment number 4).

Issues dealing with the aesthetic, historical and cultural preservation of Hanford Site land should be coordinated with representatives from Native American Nations (see comment numbers 22 and 23 related to the SEPA Checklist and the comments of the base letter for this attachment).

No consideration is given in the SEPA Checklist of the socioeconomic, cultural and traditional values placed on Hanford Site land by the Native Americans (see comment numbers 18 and 19 related to the SEPA Checklist).

Integration between RCRA and CERCLA units will not ensure that a single remedial technology or waste handling or disposal method can be utilized within the overall 300-FF-1 Operable Unit and 300 Area trenches. Integration is a function of similarities between the types of contaminants present and their associated cleanup goals that result from the appropriate and mutually-agreed upon application of risk assessment methodologies. Integration is also a function of disposal site criteria and ARARs such as Chapters II and III of DOE Order 5820.2A which requires segregation and minimization of wastes. Thus, integration between units at the Hanford Site could result in the operation of several different technologies and waste handling and disposal activities (see comment numbers 1, 2, 4, 13 and 14).

Contaminants such as Beryllium, Strontium-90 and Technetium-99 may need to be included in risk calculations and cleanup and closure determinations for the 300 Area Process Trenches (see comment numbers 6 and 8)

1. **Page 1-4, Section 1.2.3.1:** The integration of RCRA and CERCLA activities for closure of the 300 Area Process Trenches ensures physical consistency of RCRA and CERCLA unit activities in the protection of human health and the environment. Integration capitalizes on CERCLA's prior

history of remediation of the 300 Area trenches. It also allows the TSD unit to use the same cleanup levels, remediation technology, and waste handling methods as the operable unit to capitalize on the economies of a one-time, larger-scale CERCLA operable unit operation.

Comment: Integration of cleanup and closure activities at the Hanford Site is the intent of the systems-engineering approach. However, the scope of this approach reaches far beyond simply integrating closure activities for a RCRA TSD facility with remedial activities for a CERCLA past-practice unit. Systems-engineering involves the integration of all RCRA and CERCLA units at the Hanford site. Such integration, wherever and whenever possible, will result in efficient and effective site-wide utilization of available resources and in the expeditious return of land for other beneficial use.

It should be clarified here that integration between RCRA and CERCLA units will not ensure that a single remedial technology or waste handling method can be utilized within the overall area (300-FF-1 and 300 Area trenches). Integration is a function of similarities between the types of contaminants present and their associated cleanup goals that result from the appropriate and mutually agreed upon application of risk assessment methodologies. Integration is also a function of disposal site criteria and ARARs such as Chapters II and III of DOE Order 5820.2A which requires segregation and minimization of wastes. Thus, integration between units at the Hanford Site could result in the operation of several different technologies and waste handling and disposal activities.

2. **Page 1-5, Section 1.2.3.1:** If treatment by soil washing is the selected remedial alternative for the 300 Area Process Trenches, this activity will integrally bind both RCRA and CERCLA units to the use of the same cleanup levels and waste disposal methods. The soil washing unit would be remediating both RCRA and CERCLA unit soils simultaneously and the remediated soils will be used interchangeably as backfill for both units. Separation of the treatment waste or product according to unit will not be practical.

Comment: While it is agreed that the level of cleanup attainable at any contaminated area is a function of the performance of the selected remedial technology or technologies, it is not agreed that this level of cleanup should bind another area to the same performance criteria or associated waste disposal methods, nor that development of improved technologies is not warranted. As stated above in Comment 1, integration between RCRA and CERCLA units does not ensure that a single technology or waste handling or disposal method can be utilized for the overall area. Technology

selection and waste handling and disposal are functions of the types of contaminants present, their associated cleanup goals, disposal site criteria and ARARs.

Also, separation of treatment waste or products must be performed as required in the ARARs, including Chapters II and III of DOE Order 5820.2A which requires waste segregation and minimization. Where necessary technology development should be pursued to find techniques which are adequate to remediate wastes consistent with the design criteria cited in the base letter for this attachment.

3. **Pages 1-5 and 1-6, Section 1.2.3.2:** HSBRAM methodology should be acceptable for use in support of closure of the 300 Area Process Trenches. The ARARs applicable to this remedial action include MTCA Method C cleanup levels.

Comment: As stated in review comments of other Hanford documents and as re-stated below, HSBRAM methodology is considered to be inadequate in many areas including the calculation of risk from exposure to contaminated soils (500-year drilling scenario), assumed infiltration rates for the groundwater fate and transport model, assumed groundwater use, and the identification of ecological contaminants of concern using a human health-based screening process.

a) For the drilling scenario, the highest exposure to soil contaminants 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.

b) The base condition model should assume an irrigation-use scenario as a possible worst-case situation. Such a future scenario is possible as part of traditional and cultural Native American use of the land (unrestricted use). This scenario would result in higher groundwater contaminant concentrations, faster travel times to the site boundary and, therefore, more contaminants of potential concern being retained for further consideration in the risk assessment.

c) Assuming groundwater will not be used for irrigation or livestock places unreasonable restrictions on future use of the land by Native Americans and therefore presents an incomplete assessment of risk from exposure to the groundwater contaminants. Groundwater use for irrigation and watering livestock as well as for domestic drinking purposes should be incorporated into an inter-related ecological/human health risk assessment. The Yakama Nation should approve the scenarios developed to address these uses.

d) Without supporting facts, it is not agreed that human health screening values are also appropriate for ecological receptors. In addition, cumulative effects of exposure on the food chain cycle should be considered as well as how these exposures may ultimately effect human health and the religious, cultural and socioeconomic values placed on the land and its resources by Native American people and their future generations.

Also, a risk assessment prepared using HSBRAM methodology is short-sighted 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 bio-accumulation and mutagenesis, that may affect future generations; 3) ignores bio-accumulation 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.

Comments to HSBRAM methodologies such as these will continue until appropriate land use and exposure scenarios have been negotiated and agreed to with representatives from Native American Nations.

Finally, it is not agreed that future use of the 300 Area has been determined to be for industrial purposes. The Native American's expected solution for cleanup of the Hanford Site includes return of the land for unrestricted and beneficial traditional and cultural use. Pre-determination of the use of the 300 Area as industrial may be inconsistent with and preclude this expected outcome and may therefore be in

violation of Section 40 CFR 300.430 (a)(ii)(B) of CERCLA regulations.

4. **Page 1-7, Section 1.2.5.2:** CERCLA unit waste will be managed simultaneously with TSD unit waste. The CERCLA unit intends to dispose of all waste at the Environmental Restoration Disposal Facility (ERDF) as remediation waste. However, the ERDF currently cannot accept dangerous waste from a TSD unit (closure waste). Regulator agreements will be required for acceptance of TSD unit waste by the ERDF. If regulators do not designate TSD unit closure waste as a remediation waste, other agreements will be required to allow its disposal at the ERDF. TSD unit waste, although containing contamination above clean closure levels, does not designate as a dangerous waste and exists in unit soils below MTCA residential health-based cleanup standards. A contained-in determination will therefore be sought from regulators that will remove the

listing from pre-treatment soils. This will allow disposal at the ERDF with or without soil treatment.

Comment: It has not been agreed that an ERDF facility is appropriate for the Hanford Site. As stated in comments to the RI/FS report, the ERDF would result in alternatives including excavation and on-site disposal ranking higher in operable unit RI/FS documents versus alternatives involving treatment mechanisms. Thus, the ERDF would inhibit recycling efforts and the identification and development of innovative technologies, such as calcining, super-critical CO_2 application and the melter/slagger process at Oak Ridge, and ignore the systems-engineering approach to efficiently and effectively use available resources for cleanup of the entire Hanford Site and the release of land for unrestricted and beneficial use. The ERDF would be inconsistent with and preclude implementation of the Yakama Nation's desired final remedy for the Hanford Site and thereby be in violation of section 40 CFR 300.430 (a)(ii)(B) of CERCLA regulations. Also, the ERDF will result in contamination of the underlying clean soil column and vadose zone. It is unclear how DOE's justification of a preferred alternative for remediation of the 200-BP-1 Operable Unit can be based on the statement that it will not create additional waste site(s) while DOE continues to propose the ERDF for remediation of other areas.

Finally, as stated above in Comments 1 and 2, integration does not ensure that the same remedial technologies or waste handling and disposal methods can be utilized for all contaminants present in the overall area. If TSD unit soils can indeed be designated as non-dangerous waste, disposal with other dangerous wastes would be in violation of Chapters II and III of DOE Order 5820.2A as well as other ARARs.

5. **Page 3-4, Section 3.2.2:** Effluent discharged to the process trenches is now limited to 50,000 Pci/L of beta activity.

Comment: A discussion should be provided of other effluent limits, such as limits on alpha activity.

6. **Page 3-5, Section 3.3.1:** Beryllium is used to braze zirconium caps onto the fuel rods.

Comment: Beryllium is not listed in Table 3-5 as a constituent of the fuel fabrication process. Thus, questions arise as to what other chemical and radiological constituents may be lacking from Tables 3-4 and 3-5.

7. **Page 4-3, Section 4.3.2:** A risk assessment, performed within the ERA area using HSBRAM methodology, provides a high degree of confidence that eliminated constituents pose only insignificant risk to human health and the environment. The

risk assessment recognized future land use as industrial. As a result, only Benzo (a) Pyrene, Chrysene and PCBs are left as contaminants of concern for the TSD unit. These contaminants only exist in the spoils area and only at concentrations below MTCA Method C levels. Therefore, remediation of chemical contamination is not required to qualify the site for modified closure. However, remediation of the TSD unit soils would be required to qualify the site for clean closure.

Comment: As stated above in Comment 3 as well as in comments to other Hanford documents, HSBRAM methodology has been found lacking in many areas and thus results in inadequate calculations of risk from exposure to both soil and groundwater contaminants (radioactive and chemical). Furthermore, it is not agreed that modified closure of the unit is appropriate as such determination would place unacceptable restrictions on the land for cultural and traditional use by Native Americans. Appropriate and mutually-agreed upon land use and exposure scenarios must be determined for use in site risk assessments before any contaminants of concern or cleanup or closure actions can be agreed to.

8. **Page 5-3, Section 5.3.2:** Groundwater contaminants of potential concern for the unconfined aquifer beneath the 300-FF-5 Operable Unit are Total Coliform, Chloroform, 1,2-Dichloroethene, Trichloroethene, Strontium-90, Technetium-99, Tritium, Total Uranium, Uranium-234, -235 and -238, Nitrate, Nickel and Copper.

Comment: While the source of Tritium contamination beneath the 300-FF-5 Operable Unit is reported as being attributable to the 200 Area, the source of Strontium-90 and Technetium-99 should be clarified. These contaminants are listed in Appendix 7D under the summary of pre-ERA and post-ERA sampling data for the 300 Area trenches, but do not appear in other document sections or discussions. Although Section 3.3 of the document stated other discharges to the 300 Area trenches were minor and/or significantly diluted and were therefore considered insignificant when compared to discharges from fuel fabrication operations, detection of these contaminants in the groundwater system indicate a potentially significant, and thus unidentified, source may be present. If attributable to soils within the 300 Area trenches, risk calculations and proposed cleanup and closure actions could be altered. SOURCES OF CONTAMINANTS SHOULD BE IDENTIFIED AND REMEDIATED, IF NECESSARY.

9. **Page 6-1, Section 6.1:** The RCRA ISD unit is anticipated to undergo modified closure to industrial health-based cleanup standards. This is consistent with future land use of the 300

Area as an industrial site and with current contamination levels in unit soil.

Comment: It should not be inferred here that current contamination levels have any role in determining future land use and, thus, the associated health-based cleanup goals.

10. **Page 6-1, Section 6.1:** The 300-FF-1 CERCLA Operable Unit will perform all necessary physical closure activities for the 300 Area Process Trenches TSD unit. These activities include soil and structure remediation, waste management, sampling and analysis and post-remediation care. TSD unit soil cleanup levels and methods will be in accordance with the remedial action objectives and the remediation methods specified in the ROD for the 300-FF-1 Operable Unit. The CERCLA ROD will not be available until after submittal of this closure plan (Revision 0). Consequently, final closure specifications (e.g. cleanup levels and remediation technology) are not as yet known to the closure process.

Comment: Submittal of this closure plan should have been integrated more closely with the 300-FF-1 Operable Unit Feasibility Study report such that more specific closure details could have been documented and thus evaluated. As written then, this document is little more than a Work Plan for preparation of the closure report.

11. **Page 6-2, Section 6.1.2.2:** In accordance with Section 6.3.1 of the TPA Action Plan, if the closure plan also demonstrates that contaminants of concern to groundwater in unit soils also meet the clean closure criteria, groundwater monitoring in accordance with WAC 173-303-645 is not required.

Comment: WAC 173-303-645 (b)(iv) also states that in order to provide an adequate margin of safety in the prediction of potential migration of liquid the owner or operator must base any predictions made on assumptions that maximize the rate of liquid migration

As discussed above in Comment 3 as well as in comments to other Hanford documents, the maximum rate of liquid migration would occur under an irrigation-use scenario. Such a future scenario is possible as part of traditional and cultural Native American use of the land (unrestricted use). Such a scenario would have to be applied before any proposition of halting groundwater monitoring is considered.

12. **Page 6-4, Section 6.1.3:** Results of the 300-FF-5 Remedial Investigation indicate that contamination from the operable unit and TSD unit soils is not a major concern. The Phase III Feasibility Study indicates that contaminants of concern to the 300-FF-1 Operable Unit and the potential contaminants of

concern for the 300-FF-5 Operable Unit that are in the 300-FF-1 unit soils cannot be transported to groundwater in sufficient quantities to exceed groundwater standards.

Comment: As stated above in Comment 3 as well as in comments to other Hanford documents, HSBRAM methodologies to determine contaminants of concern in both soil and groundwater are inadequate in that they do not consider appropriate worst-case exposure scenarios. Contaminants of concern cannot be agreed to until appropriate HSBRAM methodology has been negotiated with Native American Nations.

13. **Page 7-5, Section 7.5.1.1:** The bird screen and TSD unit fencing, if removed and if uncontaminated, will be collapsed and disposed of in a landfill.

Comment: As part of the systems-engineering approach toward cleanup of the Hanford Site and the effective and efficient use of available resources, recycling and re-use of waste materials should be addressed.

14. **Page 7-6, Section 7.5.1.1.4:** Fixation of soil wash fines or small portions of straight disposal waste entails mixing the waste with fly ash, portland cement and water. Disposal of fixated wastes will be at the Environmental Restoration Disposal Facility.

Comment: Fixation (grouting) of waste materials is not considered a long-term approach toward protecting human health and the environment. Grouting also increases the volume of waste material, thus resulting in far more material that may require future treatment and disposal. Other methods of integrated treatment should be considered and implemented with disposal in deep geologic units.

15. **Page 2, Section A.12, SEPA Checklist:** It is believed that because the 300 Area of the Hanford Site will continue to operate in a fashion that will preclude unrestricted use, the site will be cleaned up to industrial-based standards. The potential alternatives considered to date are containment (Hanford Site Barrier), removal and disposal, or removal and treatment (soil washing).

Comment: As stated above in Comments 3 and 9, it is not agreed that future use of the 300 Area has been determined to be for industrial purposes. The Native American's expected solution for cleanup of the Hanford Site includes return of the land for unrestricted and beneficial traditional and cultural use. Pre-determination of the use of the 300 Area as industrial may be inconsistent with and preclude this expected outcome and may therefore be in violation of Section 40 CFR 300.430 (a)(ii)(B) of CERCLA regulations.

Also, as stated above in Comment 13, other methods of integrated treatment should be considered and implemented with disposal in deep geologic units.

16. **Page 8, Section 3.c.2, SEPA Checklist:** Treatment, storage and/or disposal closure waste is not anticipated to enter groundwater or surface waters regardless of the remedy selected for site remediation. Contaminated soils will either be removed or immobilized if covered with a barrier.

Comment: As stated above in Comments 3 and 7 as well as in other comments to Hanford documents, HSBRAM methodology is considered to be inadequate in many areas of assessing contaminant exposure and risk. HSBRAM does not consider a possible worst-case irrigation-use scenario of the land. Subsequently, determinations of contaminant transport through proposed barriers are incomplete.

17. **Page 8, Section 3.d, SEPA Checklist:** No impacts to water are expected by this proposal.

Comment: Use of barriers would result in the continued release of contaminants to groundwater as a result of a worst-case irrigation-use scenario Such a scenario is possible as part of traditional and cultural use of the land by Native Americans a.

18. **Page 10, Section 5.d, SEPA Checklist:** Current use of the property is industrial and is anticipated to remain so for the foreseeable future; consequently, wildlife inhabitation of the property will likely not be encouraged.

Comment: No consideration is given here of the socioeconomic, traditional and cultural values placed on the land by Native Americans.

19. **Page 12, Section 8.b, SEPA Checklist:** No part of the Hanford Site has been used for agricultural purposes since 1943.

Comment: This section of the SEPA Checklist should include a discussion of previous use of the Hanford Site by Native Americans.

20. **Page 12, Section 8.j, SEPA Checklist:** Approximately how many people would the completed project displace: None.

Comment: This statement is correct in that Native Americans will not be displaced from the Hanford Site nor kept from regaining traditional and cultural use of the land.

21. **Page 13, Section 8.l, SEPA Checklist:** Future land use for this area has not yet been determined. The CERCLA remedial

action process for the 300-FF-1 Operable Unit will consider all reasonable future land use scenarios in its establishment of appropriate cleanup levels and its selection of a remedial method to achieve those levels.

Comment: This statement is correct. However, it appears to contradict previous statements in the SEPA Checklist and the associated closure plan report that imply future use of the site will be for industrial purposes. Prior statements should be corrected to be consistent with the language in this part.

22. **Page 14, Section 10.c, SEPA Checklist:** Proposed measures to reduce or control aesthetic impacts, if any.

Comment: Restoration of the Hanford Site should be coordinated with Native American Nations to ensure aesthetic values are adequately addressed.

23. **Page 15, Section 13.c, SEPA Checklist:** Proposed measures to reduce or control impacts, if any: A cultural resources review is triggered by an excavation permit, and would ensure the consideration of potentially significant cultural sites.

Comment: This review, as part of the historical and cultural preservation of the Hanford Site, should be coordinated with Native American Nations to ensure these elements are appropriately addressed.