3.0 Responses to Hanford Solid Waste Draft Environmental Statement Comments

3.1 Federal Agency Comments and Responses

This section presents the comments and then the responses from federal agencies (e.g., USEPA) and DOE's response. The entire letter appears with comments identified in numerical order. DOE's responses to individual comments in the letter follow.

Letter: L090

3.1.1 Environmental Protection Agency, Region 10

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

Reply To
Attn Of: ECO-088 JUL 25 2002 97-062-DOE

Mr. Michael S. Collins
HSW EIS Document Manager
U.S. Department of Energy, A6-38
P.O. Box 550
Richland, WA 99352-0550

Dear Mr. Collins:

The U.S. Environmental Protection Agency (EPA) has reviewed the draft Environmental Impact Statement (EIS) for the proposed *Hanford Site Solid (Radioactive and Hazardous) Waste Program* (CEQ# 020200). This draft EIS provides environmental and technical information and examines two action alternatives for managing wastes at the Hanford Site near Richland, Washington. The Hanford Solid Waste (HSW) EIS tiers from the final Programmatic EIS for *Managing, Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* issued by the Department of Energy (DOE) in 1997. The HSW EIS also updates previous environmental reviews prepared for waste management operations at the Hanford Site.

EPA has provided comments, on this and other EISs pertaining to activities affecting the
Hanford Site, in accordance with our responsibilities under the National Environmental Policy
Act (NEPA) and Section 309 of the Clean Air Act. Generally, EPA's comments on Hanford
EISs focus on maintaining the accelerated clean-up schedule agreed to in the Tri-Party
1 Agreement (TPA) and the March 6, 2002 letter of intent by: 1) not creating additional
problematic wastes that will require future remediation; and 2) ensuring that proposed activities
would not divert resources or capacity from clean-up activities.

We have rated the HSW draft EIS, EO-2 (Environmental Objection – Insufficient
Information) because: 1) all action alternatives are predicted to exceed Maximum Contaminant
Levels (MCLs) of iodine-129 and that other radionuclides (e.g., technetium-99) would contribute
2 additionally to the exceedance of radionuclide MCLs thereby contaminating or worsening
contamination problems in the vadose zone and groundwater, and thus potentially create more
required clean-up; and 2) insufficient information exists to fully describe existing and predicted
environmental impacts, and if proposed activities would divert resources or capacity from the
clean-up scheduled at Hanford. It also appears that predicted contamination from action
alternatives could be avoided with mitigation measures and adoption of other alternatives.

EPA believes the following changes to the EIS (with similar commitments in the Record of Decision) are necessary to make the document and proposed project environmentally acceptable:

- Present and analyze a full range of reasonable alternatives with additional mitigation
measures [e.g., Environmental Restoration Disposal Facility (ERDF)-like mega-trench,
3 altering volume or WAC of imported waste streams] which would be in compliance with
environmental standards, reflect real differences in environmental impacts, and that
address scoping comments and comments on the draft EIS;

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4 • Provide more extensive analyses and description in the EIS disclosing existing impacts [e.g., estimating pre-1970 transuranic waste (TRU) or emissions from remedial actions], elements of action alternatives (e.g., the types of treatment proposed in the T-plant or the M-91 facility), and greater detail about the cumulative impacts as well as a breakdown of impacts from disposing wastes originating at Hanford versus other sites;

5 • Ensure consistency between the WAC and regulations of comparable disposal sites or provide a reasonable and scientifically valid explanation of the difference in the EIS; and

6 • Provide a clear purpose and need statement preferably identifying disposal of Hanford waste streams as the primary need and treatment and disposal of certain off-site wastes as the secondary need.

Enclosed are a description of our rating system and EPA's detailed comments which discuss the basis of our environmental objections with the proposed project and the EIS as well as methods of addressing our environmental objections. EPA is eager to work with DOE, and when appropriate, the Washington Department of Ecology, in the resolution of these issues. Please contact Mr. Chris Gebhardt, of my staff, at (206) 553-0253 or Mr. David Einan, in EPA's Hanford Operation Office, at (509) 376-3883 to discuss these issues further. Thank you for the opportunity to comment and for providing Mr. Gebhardt the opportunity to visit the Hanford Site.

Sincerely,

Elbert Moore

Elbert Moore, Director
Office of Ecosystems and Communities

Enclosures

cc: Mike Wilson, Ecology
Richard Gay, CTUIR
Pat Sobotta, Nez Perce Tribe
Russell Jim, Yakama Tribe
Todd Martin, HAB
Ken Niles, OOE

EPA's Detailed Comments on the Draft Environmental Impact Statement (EIS) for the Hanford Solid Waste Program

General Comments

<u>Further Contamination of the Vadose Zone and Groundwater</u>
For both Alternatives 1 and 2, the Mixed Low Level Waste (MLLW) estimates for groundwater
impacts from iodine-129 show Maximum Contaminant Levels (MCLs) exceeded for both lower
7 and upper bound waste volumes. Other radionucludes (e.g., technetium-99) contribute
additionally to the exceedence of radionuclide MCLs. MCL exceedences in groundwater are
generally not acceptable as design elements for proposed actions. These results would appear to
effectively disqualify both these alternatives. Variations of these alternatives or new alternatives,
which restrict radionuclide quantities so as to prevent MCL exceedences, need to be considered.

<u>Alternatives</u>
EISs should rigorously explore and objectively evaluate all reasonable alternatives
[40 CFR 1502.14(a)] to help ensure that decisionmakers take actions that protect, restore, and
8 enhance the environment [40 CFR 1500.1 (c)]. The range of alternatives in the Handford Solid
Waste (HSW) EIS is essentially limited to existing and enhanced trench options. Wastes are
assumed to be disposed consistent with the Waste Acceptance Criteria (WAC). There is no
consideration in the range of alternatives of actions that could be taken (in addition to those of
the WAC) to mitigate impacts.

It appears that alternatives were formulated based on cost concerns rather than environmental
ones. The common significant theme found among the elements of Alternative 1 (i.e., modify
the T-Plant, treat wastes commercially, and dispose of waste in larger trenches), when compared
9 to the elements of Alternative 2 (i.e., build the new M-91 Plant, treat wastes at Hanford, and
dispose of waste in smaller trenches), is reduced cost. This contrasts with the National
Environmental Policy Act (NEPA) at 40 CFR 1502.14, which directs lead agencies to present the
environmental impacts [italics added for emphasis] of the proposal and the alternatives in
comparative form, thus sharply defining the issues and providing a clear basis for choice.

At the same time, both action alternatives are environmentally objectionable because they result
in predicted impacts that cause or contribute to exceedences of radionuclide MCLs in
groundwater. The EIS should be revised to include a fuller range of alternatives with additional
10 mitigation measures, if necessary [40 CFR 1502.14(f) and 1502.16(h)]. Alternatives which EPA
believes merit further examination include Environmental Restoration Disposal Facility (ERDF)-
like mega trench, varying WAC, volumes imported from offsite, packaging, and capping, and
limiting radionuclide concentrations. The Department of Energy (DOE) should issue a
supplemental draft Programmatic EIS if adding additional alternatives makes substantial changes
relevant to environmental concerns [40 CFR 1502.9(c)].

Finally, the EIS should contain a fuller discussion of the no action alternative. The EIS describes
how the final Programmatic EIS for *Managing, Treatment, Storage, and Disposal of Radioactive
and Hazardous Waste* and subsequent Record of Decision (ROD) have selected the Hanford Site
and the Nevada Test Site to be the DOE facilities responsible for the treatment, storage, and
11 disposal of Low Level Waste (LLW) and MLLW originating from DOE facilities that lack these
capabilities. The Hanford Site and Nevada Test Site could each receive all to none of these
offsite wastes with the other receiving the remainder. The EIS should describe the range of
possible scenarios involving the distribution of off-site wastes between the Hanford Site and the
Nevada Test Site and the environmental consequences when describing the No Action
Alternative.

<u>Disparity between WAC and 10 CFR 61</u>
Note that the radionuclide concentrations permitted by the WAC exceed those permitted under
12 10 CFR 61 for the commercially-licensed low level radioactive waste disposal site on the
Hanford Reservation. The EIS should address the inconsistency between these two disposal
circumstances. What specific technical provisions make such waste [e.g., Transuranic waste
(TRU) exceeding 100 nCi/g] unacceptable at the commercial site, yet acceptable at the
neighboring DOE site?

The EIS should incorporate a section specifically comparing future alternatives to existing
13 disposals, their requirements (including waste acceptance critieria), and risks. Alternatives
should be considered which provide additional isolation for wastes exceeding 10 CFR 61 criteria
for shallow disposal. For example, the "greater confinement disposal" approach at the Nevada
Test Site for similar wastes should be considered.

<u>Consistent analyses: Intruder risks</u>
Intruder risks are evaluated at Section 5.11.4, but only out to 500 years. Commercial sites
complying with 10 CFR 61 can limit evaluation of intruder risks to 500 years because of the
14 limits placed on concentration by 10 CFR 61 (i.e., greater than "Class C" waste is not permitted
for disposal). Since the DOE WAC allows for disposal of greater than "Class C" waste, and
since some of this waste (e.g., TRU waste) has long halflives, the EIS should evaluate intruder
risks beyond 500 years. Specifically, the EIS should evaluate intruder risks for a period of time
consistent with other pathway evaluations in the EIS (e.g., the 10,000 year period evaluated for
groundwater).

<u>Groundwater analyses: Technical comments</u>
For groundwater impacts, the location of concern is not the location selected "1-km along the
15 Columbia." Groundwater impacts apply anywhere in the aquifer, and in that context the well
1-km from the waste site provides a more appropriate evaluation of impacts.

The evaluations of radionuclude in groundwater do not properly characterize their impacts in the
16 context of drinking water standards. Radionuclide MCLs are additive. The criteria apply using a
"sum of fractions" approach so that if one radionuclide is at 0.6 of its MCL and another is at 0.5,

16 (cont) the sum of fractions is 1.1 and the radionuclide MCL requirements have been exceeded. When this is taken into account, the predicted MCL exceedences at the location 1-km from the waste site (counting all radionuclides) are even greater than indicated. In evaluating alternatives with regard to groundwater impacts from radionuclides, the MCL sum of fractions for the radionuclide contaminants should be the primary basis for comparison.

Purpose and need statement

17 The purpose and need statement should be stated more clearly. The scope of the purpose and need statement appears to be limited to the treatment, storage, and disposal of current and anticipated volumes of wastes solely of Hanford origin and to not include similar activities for imported, off-site wastes. This should be clarified. In addition, the use of the word "enhance" or "enhanced" in the context of the purpose and need statement, as well as when describing the wider trenches, seems subjective and pre-determined, and thus inappropriate. The EIS should use less subjective words in the EIS and let the reader and the decision-maker decide the appropriate mechanism (including the no action alternative) to enhance or improve solid waste disposal at Hanford.

The purpose and need statement should be rewritten to clearly articulate the primary need for this EIS in relation to Hanford's current waste inventory, its impact on Hanford cleanup, and the secondary need as the treatment and disposal of certain off-site wastes.

Public participation

18 As a general observation, it is not clear that the comments received during scoping were not considered in the draft EIS. For example, page A.4 contains a scoping comment received by DOE that managing wastes using primarily cost considerations has been largely responsible for the magnitude of DOE's existing complex-wide clean-up problem. EPA believes that this comment was not adequately addressed in the draft EIS. The EIS should demonstrate more clearly that scoping comments (and subsequently comments made on the draft EIS) were used to identify significant issues [40 CFR 1500.4(g)].

In addition, the EIS states that the public meetings held during the scoping period extended through January 30, 1998. The EIS should state how DOE ensured that significant issues did not arise in the 4 year interim between the last scoping meeting and the issuance of this draft EIS.

Other general comments

19 The body of the EIS tends to repeat information in many places. EPA suggests that the document be reviewed for redundancies and that vital information from each appendix be summarized in the body of the EIS to allow the reader to understand what is being analyzed and the impacts are.

20 We commend DOE for using side-bar definitions which assist the non-technical reader of the EIS.

21 The HSW EIS needs to be updated to ensure consistency with the Hanford Management Plan.

22 Referencing the "Hanford Site Solid Waste Acceptance Criteria" (WAC) so extensively will make those criteria harder to change, from a performance assessment, impact assessment, and NEPA standpoint. Instead, the EIS should state what the WAC criteria are.

23 The EIS lacks sufficient detail to understand what types of treatment would occur in either the T-plant or the proposed M-91 facility under Alternatives 1 and 2, respectively.

Specific Comments

24 1) Summary – EPA is pleased that DOE views the Hanford Solid Waste EIS as a vehicle to update previous documents and to provide evaluations for activities that may be implemented as a result of DOE decisions on the Waste Management Programmatic EIS. EPA believes that additional documentation to complement the brief analysis and description of Hanford included in the *Waste Management Programmatic* EIS is needed. The EIS should include this brief analysis in its entirety, as well as the Record of Decision from the *Waste Management Programmatic* EIS, since this documentation is seen as providing the need for this project.

25 2) Page S.4, Waste Types Analyzed, page S.5, sidebar – The definition of TRU differentiates it from high-level radioactive waste, and identifies the lower radionuclide and half-life limits. EPA recommends that this definition be expanded to explain how TRU differs from high-level wastes and identify upper radionuclide and half-life limits, if these limits exist.

26 3) Page S.4, Waste Types Analyzed, page S.5 states that beginning in 1987, treatment of MLLW (generally immobilization, removal, or destruction of the hazardous component) was required before it could be sent to a Resource Conservation and Recovery Act (RCRA) permitted land disposal facility. MLLW is defined as waste that contains both radionuclides and hazardous components. The EIS should describe how, if the hazardous component is dealt with, RCRA-permitted land disposal facilities address the remaining radionuclide component subject to the Atomic Energy Act.

27 4) Section S.04, Waste Types, page S.6 – Since this EIS is supposed to bound conditions, it is not clear why an estimate of pre-1970 TRU was not provided. The EIS should provide this explanation. In addition, the explanation of "suspect" TRU waste is confusing and the
28 statement that DOE has not determined whether to retrieve and process "suspect" TRU waste as TRU waste or leave it buried in Low Level Burial Grounds (LLBGs) is concerning. Do future references to TRU in the document allude only to TRU or do they also include "suspect" TRU wastes? Why was the decision concerning how to best deal with "suspect" TRU not made prior to, or as part of, this EIS? It appears that the outcome of this decision will have a bearing on the program design, either the quantity of waste treated as TRU would increase or LLBGs would need design parameters sufficient to contain unknown quantities of TRU in an environmentally sound manner. The EIS should discuss "suspect" TRU, the environmental risks it poses, and how it influences the design of action alternatives.

29 5) Sections S.6.1.1, S.6.1.2, S.6.2.1, and S.6.2.2 begin with the conditioning statement, "when needed." The EIS should state when waste needs to be inspected and verified.

30 6) Table S.1, Summary Comparison of Alternatives, page S.11 states that under Alternative 1, non-conforming wastes would be treated commercially. Are such facilities available? If not, when would they be made available?

31 7) Section S.8.5, Cumulative Impacts, page S.20 states that impacts for all resources considered in the HSW EIS are relatively small and would not be expected to contribute substantially to impacts of other activities at Hanford or in the surrounding region. EPA strongly believes environmental impacts from proposed action alternatives which exceed or contribute to exceedences of MCLs in the groundwater and vadose zone should not be trivialized by comparing them to the nationally significant impacts which have occurred at the Hanford Site over the last 56 years. Instead, impacts which exceed MCLs be viewed as adding to an already environmentally unsatisfactory situation requiring clean-up with the impacts from these actions.

32 8) Section S.8.6, Mitigation, page S.20 – Trust organizations should be added as a group that needs to agree on the appropriate mitigation measures and this section should include mitigation measures for groundwater and the vadose zone, since they would result in exceedences of MCLs.

33 9) Section 1.4.1, Scoping Process, page 1.5 – The EIS states that decommissioning, surveillance, and maintenance activities that occur after closure of the waste management facilities, are not included within the scope of the HSW EIS. The EIS should state why this is the case and when and how they will be considered.

34 10) Section 1.4.1, Waste Volumes, page 1.6 – The EIS states that within the alternatives for LLW and MLLW, a range of waste volumes was evaluated to reflect the uncertainties in future waste receipts at the Hanford Site. The EIS should include statistical analyses and tools to describe the level of uncertainty and then explain it in language understandable to the general public. Statistical tools that could be employed are the expected mean, confidence intervals, and standard error.

35 11) Section 1.5.12, Tri-Party Agreement, page 1.15 – The EIS should describe how successful Hanford has been at meeting past milestones established in the Tri-Party Agreement (TPA).

36 12) Section 1.5.1.2, RCRA Requirements, page 1.16 – This section states that DOE is currently characterizing sites in the 200 area. The EIS should state when this characterization is scheduled to be completed and if draft information from this incomplete characterization is, or should be, included in the EIS.

37 13) Section 1.5.2, EA for Trench Construction, page 1.18 – The EIS should explain why DOE analyzed the construction and operation of four LLW disposal trenches in the Hanford Site 200 East and West Areas in the 2001 Environmental Assessment rather than analyzing these activities in this EIS.

38 14) Section 1.5.3, Related NEPA Documents, page1.18 – The EIS should identify related NEPA documents or other environmental processes which analyze methods to avoid and minimize the production of wastes which subsequently needs to be stored, treated and disposed.

39 15) Section 1.5.3, Tank Waste Remediation, page 1.21 – The EIS states that the tank waste remediation program is expected to be a major generator of LLW and MLLW sent to the solid waste program for disposal in the Hanford LLBGs. The EIS should explain this process in greater detail, estimate the significant waste volume potentially generated by the tank waste remediation program, state whether this waste stream is included in the waste volume estimates in the EIS, and if not, explain why not.

40 16) Section 1.5.3, Waste PEIS, page 1.22 states that DOE decided in its February 25, 2000 ROD for LLW and MLLW states that DOE sites that have existing capacity to treat or dispose of LLW and MLLW would do so and that Hanford and Nevada Test Site would receive these wastes from DOE sites that lack this capacity. The EIS should give readers and the decision-makers additional information about the amount of off-site waste Hanford would receive. For example, the EIS could describe how DOE would divide between the Hanford Site and Nevada Test Site, wastes that other DOE facilities lack the capacity to treat or dispose. In addition, the EIS could use historical information to describe how much waste Hanford has received in past years from these facilities.

41 17) Section 1.5.3, EA for disposition of surplus U, page 1.23 – The EIS should state whether the remaining uranium is included in the estimates of wastes bounded in the EIS. The 3rd paragraph of this section should clearly state that ERDF is constructed to meet all the requirements of a hazardous waste landfill.

42 18) Section 2.1.1, LLW Streams, page 2.3 – This section describes verification that on-and off-site waste meet WAC. The EIS should describe this in greater detail. For example, how often is a random sampling taken of wastes? How often do tested wastes fail to meet the WAC? Are verifiers at generators and Hanford independent of site operators?

43 19) Section 2.1.2, MLLW Streams, page 2.5 – The EIS should describe the success of contracts intended to serve as a technical demonstration for future commercial treatment of the majority of Hanford's MLLW. This information is relevant to evaluating action alternatives included in the draft EIS.

44 20) Section 2.1.3.6, TRU Waste-Newly Generated, page 2.10 – The EIS should state when the Waste Isolation Pilot Plant (WIPP) waste criteria or shipping system are expected to be in place and if draft guidance for the waste criteria or shipping system currently exist.

45 21) Section 2.1.3.7, TRU Waste-K Basin Sludge page 2.10 – The EIS should clearly state that
the K-Basin sludge does not require treatment for PCBs.

22) Section 2.2.2.4, T-Plant Complex, page 2.18 – The EIS states that current plans are to use
the water-filled basins for the K Basin sludge until a treatment facility for the sludge is
46 available. The EIS should estimate when such a facility would be available. The EIS
should state whether using the T-Plant for this activity would restrict proposed uses of this
facility.

23) Sidebar New M-91 Facility, page 2.20 – The EIS only identifies potential treatment
47 capabilities. The EIS should analyze appropriate technological capabilities to include in
this plant or defer to another NEPA process.

24) Section 2.2.3.1, Existing LLW Trenches, page 2.24 – The EIS states that soil is placed over
48 the waste so that surface is near the original grade. The EIS should state why soil is not
mounded over the trenches to shed water and avoid precipitation from infiltrating into the
wastes.

25) Sections 2.2.3.1 and 2.2.3.2, Sidebars of Current and Enhanced LLW, MLLW Trenches,
49 pages 2.24 and 2.25 – The EIS should compare the two alternatives from an environmental
as well as a cost/capacity basis.

50 26) Section 2.2.3.2, Existing MLLW Trenches, page 2.26 – The EIS should state to what extent
evapotranspiration rate will prevent infiltration through the layers of the Modified RCRA
51 Subtitle C Barrier. "HWS" should be "HSW."

27) Section 3.2.2, MLLW Alt. 2, page 3.4 – The EIS states that the new M-91 facility would
52 use non-thermal technology to treat organic solids and debris. The EIS should state why
thermal treatments are excluded.

28) Section 3.3.1, Post 1970 TRU Alt. 1, page 3.6 – The EIS states that for the purpose of
53 analysis, this EIS assumes that WIPP would have the necessary administrative and
permitting authority to accept these wastes. The EIS should state when DOE expects WIPP
would have the necessary authorities to accept wastes and if significant obstacles to obtain
those authorities appear to exist.

29) Section 3.5, Other Alternatives Considered, pages 3.9-3.12 – EPA assumes that this section
describes alternatives eliminated from detailed study, although this is not explicitly stated.
NEPA regulations at 40 CFR 1502.14 (a) states that the Alternatives chapter should briefly
54 discuss the reasons for alternatives having been eliminated. In many cases, the brief
discussion does not convincingly state why alternatives were eliminated from
consideration. For example, the EIS eliminates many treatment options based on the
premise that environmental impacts would be similar. We do not find this rationale to be

54 (cont) sufficient to withhold them from consideration by the decision-maker, especially because
formulation of action alternatives appear to be driven primarily by cost concerns. EPA
disagrees with eliminating alternatives because these options are being addressed under
Superfund. NEPA and Superfund actions are not necessarily mutually exclusive and, when
possible, should complement each other. Finally, EPA has identified several reasonable
alternatives that the EIS should have examined but did not, including ERDF-like mega
trench, varying WAC, volumes imported from offsite, packaging, and capping, and limiting
radionuclide concentrations.

30) Section 3.5.2.5, Mobile Treatment, page 3.10 – Mobile treatment facilities may be practical
55 for treating certain waste streams. The EIS should state whether not including this option
in the EIS precludes its use later on.

31) Section 3.5.3.1, ERDF, page 3.11 – The section states that ERDF was rejected as an option
because none of the waste is generated by Superfund actions. As discussed at the C3T
56 meeting in June, that may not be the case. The Tri-Party Agencies have the ability to use
the Superfund process when appropriate for many waste streams at Hanford. EPA suggests
that you include this option in the EIS.

32) Table 3.5, Comparison of Impacts, page 3.13 – The EIS should explain why maximum
nuclide concentrations for iodine-129 and technetium-99 are greatest in the No Action
57 Alternative when less waste would be buried. Table 3.5 should also identify the time
period after action alternatives are adopted that these maximum concentrations are
predicted.

33) Section 3.7, Costs of Alternatives, page 3.15 – Costs should include total life cycle costs
such as cap replacements, institutional control requirements, etc. The EIS should not rely
58 on net present value estimates. The EIS should also state how costs were predicted for the
No Action Alternative. Were costs discounted based on when DOE predicts treatment and
disposal of the majority of MLLW and difficult to treat TRU? Did the EIS employ
consistent methodology for estimating the costs of all the alternatives?

34) Section 3.8, DOE Preferred Alternative, page 3.16 states that Alternative 1 is the most cost
effective and environmental preferable approach to waste management at Hanford. This
59 section should provide more supporting detail. For example, it should state the overall cost
savings as well as show how Alternative 1 was and was not environmental preferable to
Alternative 2 and the No Action Alternative.

35) Section 4.2.2, 200 Areas, page 4.7 states that the T-Plant Complex is storing 27 metric tons
60 (30 tons) of spent reactor fuel (from Shippingport, Pennsylvania) and that this fuel will be
dried out and moved out of the T-Plant canyon. The EIS should state how this waste is
classified (e.g., TRU or Hi-Level Waste), when it will be moved, and its final destination.

61 36) Section 4.2.2, 200 Areas, page 4.10 describes 11 miles of underground pipeline used for
non-RCRA-permitted waste streams. The EIS should state if this pipeline exists to

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61 (cont) facilitate movement of the waste within the 90 day period allowed by RCRA. Paragraph three of the same page states that surface contamination is present in three of the older LLBGs. The EIS should state the source, type, and level of the contamination.

62 37) Table 4.3, page 4.18 expresses probability in scientific notation. We believe the general readership would find probability expressed as fractions easier to understand. Likewise, we believe the general readership would more readily identify with English units rather than metric ones. It is recommended that English units are expressed first with metric equivalents being placed in parenthesis.

63 38) Table 4.6.and 4.7 – These tables should include emissions from remedial actions to be complete. Also, the table should label the two columns under the labels, 200 Area and 300 Area.

64 39) Section 4.4.1, Topography and Geomorphology, page 4.24 refers to sea level and mean sea level. The EIS should state what is the difference between the two. The EIS also describes Holocene eolian activity. We recommend that the EIS define eolian in the text or the glossary.

65 40) Section 4.4.4, Seismicity, page 4.31states that other earthquakes with Richter magnitudes > or = 5 and or MMI of VI occurred around Lake Chelan. The EIS should date these earthquakes to make them consistent with the surrounding sentences.

66 41) Section 4.5.14, Onsite Ponds, page 4.36 states that evaporation has also led to relatively high levels of uranium due to concentration of natural sources. The EIS should describe in greater detail natural sources of uranium found at the Hanford Site and the extent that naturally occurring uranium contributes to radionuclide effects.

67 42) Page 4.37 – Chapter 4 appears to lack a section on surface water quality. The EIS should include such a section or explain why such a section is unnecessary.

68 43) Page 4.51, Section Biological and Ecological Resources, pages 4.51 and 4.52 appear to contain contradictory statements. Page 4.51 states that nonnative vegetation species currently dominate the landscape and page 4.52 states that native perennial shrubs and bunchgrasses generally dominate plant communities on the site. The EIS should clarify these statements.

69 44) Section 4.6.1, 200 Area Plants, page 4.59 – This section states that Russian thistle and gray rabbitbrush are deep rooted and have the potential to accumulate radionuclides and other buried contaminants, functioning as a pathway to other parts of the ecosystem. The EIS should identify these pathways including wildlife that consume these species and describe the impacts to these receptors.

70 45) Section 4.6.2, Wildlife, page 4.63 states that West Lake has shrunk and the remnant small isolated pools and mud flats do not support coots and other nesting waterfowl. The EIS should also discuss impacts on amphibians and other water-reliant wildlife, if applicable.

71 46) Section 4.7.1, Native American Cultural Resources, page 4.70 – The EIS should state whether tribes who signed treaties reserving their ability to hunt, fish, collect berries, etc., on the Hanford Reservation can do so. If not, the EIS should state how the Federal government has resolved this conflict with agreed upon treaty rights. The third paragraph states that well-watered areas inland from the river also show evidence of concentrated human activity. The EIS should define concentrated human activity (e.g., gatherings, communal living, agriculture).

72 47) Section 4.8.5, Local and Regional Transportation, page 4.86 describes Level of Service (LOS) without identifying the LOS for roads on the Hanford Reservation.

73 48) Section 4.8.9, Utilities, page 4.8.8 describes how water systems in the Tri-City area rely on groundwater. The EIS should state if groundwater contamination described earlier in the EIS affects these water supplies as well as their status under the Safe Drinking Water Act.

74 49) Section 5.2, Air Quality, page 5.6 – EPA supports the use of environmentally conservative modeling to compensate for errors inherent in modeling and to ensure that the full extent of impacts is understood and mitigated for.

75 50) Tables 5.15 - 5.28 – The incremental impacts of future offsite wastes should be separately tabulated based on the upper and lower bound cases presented.

76 51) Section 5.14 – Cumulative risks presented should include risks from transuranic disposals (not included in Table 5.61) and should show comparative risks over time (not just at the end of 2046 – see Table 5.61).

77 52) Section 5.18, Potential Mitigation Measures, page 5.112-114 – The EIS should identify potential mitigation measures for groundwater.

78 53) Section 5.3.2, Methods for Assessment of Long-term Impacts, page 5.13 – EPA recommends that the assessment include wastes streams resulting from clean-up actions.

79 54) Section 5.3.2, Methods for Assessment of Long-term Impacts, page 5.14 states that inventories of retrievably stored TRU waste in trenches and caissons located in the LLBGs were not considered because they will eventually be retrieved and sent to the WIPP for disposal. The EIS should estimate when these wastes will be sent to WIPP and if releases are likely to occur in the interim.

80 55) Section 5.3.3 – This section does not address the important technical consideration of plutonium mobile fractions. Recent evidence is that small but highly mobile fractions of plutonium wastes can have significant impacts over the short term as well as the 10,000 year groundwater timeframe considered in the EIS. In addition, plutonium is know to exist in a number of oxidation states each of which has unique mobility characteristics. Transuranic wastes should not be screened out of future groundwater evaluations without consideration of the complex nature of plutonium chemistry, facilitated transport, and mobility. The EIS should include a section discussing the potential for mobile plutonium fractions, possible impacts on risk estimates, and actions that could be taken to mitigate impacts.

81 56) Section 5.3.3, Long-term Impacts on Water Quality, pages 5.18-5.20 does not differentiate the long-term impacts between alternatives on water quality. The EIS should do so to make meaningful information available to the decisionmaker for comparing alternatives.

82 57) Section 5.5.1, LLBGs, page 5.22 states that any mitigation for plant and animal species of concern within the 200 Areas would follow DOE policy. The EIS should identify specific mitigation measures for plant and animal species of concerns and commitments to implement these mitigation measures made in the ROD. The EIS should also state or summarize the referenced DOE policy.

83 58) Section 5.5.1, LLBGs, page 5.22 describes how the LLBGs and Area C were denuded by the 2000 range fire. The EIS should state if the fire disturbed the area to the extent that native shrub steppe vegetation is unable to recover, if action alternatives would further undermine the reestablishment of native vegetation, and if additional mitigation measures are necessary.

84 59) Section 5.7.1, Alternative 1, page 5.33 states that there is a reasonable probability that archeological sites are located within Area C, that these sites are likely to be buried, and any discovery is likely to result in new knowledge. The EIS should, to the extent possible, identify specific methods to ensure protection of buried deposits and the ROD should commit to use these methods.

85 60) Section 5.8, Traffic and Transportation, page 5.34 – This section should provide a summary of impacts from shipping off-site wastes to Hanford.

86 61) Table 5.16, Hazardous Chemical Concentrations, page 5.37 – The four chemicals exceeding TEEL-2 guidelines should be bolded in the table.

87 62) Table 6.1, TPA Milestones, page 6.3 – The EIS should clearly state what the date of December 2049 for M-91-00 signifies.

88 63) Section G.2.1.3, MLLW, page G.49 – This section states that "No uranium or carbon-14 was estimated to reach the water table from MLLW in the 200 West Area within the period of analysis." The same section also states that these contaminants "were found to be at their maximum level at the 1-km well just before and at 10,000 years." These two statements appear to be inconsistent since for maximum to be reached at 10,000 years, some quantity must be present in the water table prior to that. The analysis period is 10,000 years and both carbon-14 and uranium can be relatively mobile. Additional explanation is needed to justify the concentration estimate for these radionuclides.

<u>Editorial Comments</u> (No Response Needed)

89 Section 1.5.2, Trench 33 and Widening Trench 36, page 1.17 – It appears that the word "Impact" is missing from the wording Environmental Statement (ERDA 1975). There was not a citation in the reference section to confirm or deny whether a word was missing.

90 Section 1.5.3, WIPP, page 1.23 should replace the word "supplement" with "supplemental EIS."

91 Section 2.1.1.2, LLW-Category 3, page 2.3 and 2.4 – The EIS should replace "greater confinement" and "monolithic waste form" with easier to understand terms if available.

92 Section 4.7.1, Native American Cultural Resources, page 4.71 should read "Reconnaissance of selected locations conducted through the mid-1980s, as well as systematic archeological surveys conducted from the middle 1980s through 1996 added to the recorded site inventories."

93 Section 4.8.1, Local Economy, page 4.74 – A space should be placed between "and" and "payrolls."

94 Section 5.5.1, LLBGs, page 5.22 should read, "Both of these species are relatively common on the 200 Area Plateau."

U.S. Environmental Protection Agency Rating System for
Draft Environmental Impact Statements
Definitions and Follow-Up Action*

Environmental Impact of the Action

LO – Lack of Objections

The Environmental Protection Agency (EPA) review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC – Environmental Concerns

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce these impacts.

EO – Environmental Objections

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no-action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU – Environmentally Unsatisfactory

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact Statement

Category 1 – Adequate

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis of data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2 – Insufficient Information

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonaby available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses or discussion should be included in the final EIS.

Category 3 – Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the National Environmental Policy Act and or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

* From EPA Manual 1640 Policy and Procedures for the Review of Federal Actions Impacting the Environment. February, 1987.

Responses to Letter L090

Comments	Responses
1	The U.S. Department of Energy (DOE) is committed to cleanup of the Hanford Site through the Tri-Party Agreement (TPA) process. DOE does not believe that any offsite DOE wastes shipped to Hanford will be problematic, will complicate future remediations, or that they will divert resources or disposal capacity from other Hanford cleanup activities.
2	The first draft *Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement* (HWS EIS) used available data, computer modeling, assumptions, and related analytical methods to produce estimates of reasonably foreseeable environmental impacts. The analytical approach was consistently applied to each alternative, and it provided information that allowed objective parametric comparison of the alternatives. Additional alternatives have been evaluated and discussion of impacts has been substantially expanded in this HSW EIS (see Section 5.3 and Appendix G for groundwater impacts, Section 5.11 and Appendix F for human health effects, Section 5.14 and Appendix L for cumulative impacts, and Section 5.18 for potential mitigation measures in Volumes I and II of this EIS). Most of the action alternatives analyzed in this EIS do not exceed the maximum contaminant levels (MCLs) or applicable regulatory standards. By the time the waste constituents from this action are predicted to reach groundwater (100s of years), as projected and shown in the concentration-versus-time figures in Section 5.3, they will not exceed the concentration levels (or the dose limits), because the existing groundwater concentrations will have decreased by then. Therefore, the cumulative groundwater impacts from the proposed action would not exceed applicable regulatory standards (or the MCLs).
3	Additional alternatives have been evaluated in part to address public comments received on the first draft HSW EIS. These alternatives include disposal at the Environmental Restoration and Disposal Facility (ERDF) and disposal at ERDF-like mega-trenches at various locations. See Section 3 of the EIS for descriptions of all alternatives. This HSW EIS evaluates a slightly larger range of volumes—see Section 3.2 for discussion of the range of waste volumes evaluated.
4	The impacts of activities not within the scope of the proposed action are discussed as part of cumulative impacts. The evaluation of cumulative impacts has been substantially expanded (see Section 5.14 and Appendix L in Volumes I and II of this EIS). One of the purposes of evaluating a range of volumes, including Hanford Only waste, is to determine the incremental impacts of managing waste from other DOE generators.
5	Please see Responses 12 and 13.

Responses to Letter L090

Comments	Responses
6	The revised draft HSW EIS includes a revised purpose and need statement that was developed in consultation with U.S. Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology) staff. The revised statement includes disposal of existing and anticipated quantities of Hanford waste streams and potential wastes from offsite sources.
7	Additional alternatives have been evaluated and discussion of impacts has been substantially expanded in this revised draft HSW EIS (see Section 5.3 and Appendix G for groundwater impacts, Section 5.11 and Appendix F for human health effects, and Section 5.14 and Appendix L for cumulative impacts in Volumes I and II of this EIS). Most action alternatives analyzed in this EIS do not exceed the MCLs or applicable regulatory standards. By the time the waste constituents from this action are predicted to reach groundwater (100s of years), as projected and shown in the concentration-versus-time figures in Section 5.3, they will not exceed the concentration levels (or the dose limits), because the existing groundwater concentrations will have decreased by then. Therefore, the cumulative groundwater impacts from the proposed action would not exceed applicable regulatory standards (or the MCLs).
8	Additional alternatives have been evaluated in this revised draft HSW EIS. The additional alternatives evaluated in this EIS include the use of lined and capped facilities similar to Resource Conservation and Recovery Act (RCRA) Subtitle C requirements. DOE evaluates the performance of each disposal facility in detail to ensure the facility meets the DOE Performance Assessment requirements. If groundwater contamination in excess of DOE limits were predicted by the Performance Assessment process, changes in the waste acceptance criteria would be made to limit disposal of the waste causing the groundwater contamination. The waste would require further treatment prior to disposal or would be stored until a method was found to treat or dispose of the waste. In no case would DOE knowingly dispose of waste in violation of legal requirements.
9	The alternatives evaluated in this HSW EIS were formulated based on the underlying purpose and need for agency action, and in consideration of the Waste Management Programmatic Environmental Impact Statement (WM PEIS) Record of Decision (ROD) for management of low-level waste (LLW) and mixed low-level waste (MLLW) (65 FR 10061). DOE also factored in public scoping comments. The EIS does provide a comparative analysis/discussion of the potential environmental impacts associated with the proposed action and alternatives (see Section 3.4).
10	The revised draft HSW EIS analyzes additional alternatives that include mitigation measures such as liners, leachate collection systems, a lined mega-trench, ranges of waste volumes, and capping.

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Comments **Responses**

DOE prepared this revised draft HSW EIS to accommodate disposal of ILAW, in addition to new waste management alternatives under consideration since the first draft was issued in April 2002. The HSW EIS includes additional alternatives for disposal of LLW, MLLW, immobilized low-activity waste (ILAW), and Waste Treatment Plant (WTP) melters in either independent or combined-use facilities that would comply with applicable RCRA and state standards for disposal of hazardous wastes. A number of locations for the facilities are considered, including at ERDF.

The revised draft HSW EIS also evaluates various forecast waste quantities that include only Hanford generated waste, in addition to varying amounts of offsite waste. This evaluation reflects the uncertainty in waste quantities that Hanford might receive under the WM PEIS decisions for MLLW, LLW, and TRU waste. The inclusion of a Hanford Only waste volume provides the basis for determining the incremental impacts of offsite waste. The Hanford Site Solid Waste Acceptance Criteria (HSSWAC) and radionuclide inventories would be revised as needed, based on periodic performance assessment updates prepared during operations, to ensure that long-term impacts would not exceed established dose standards.

11 This HSW EIS includes additional discussion of the No Action Alternative. The No Action Alternative does evaluate Hanford Only waste volumes.

This HSW EIS also evaluates various forecast waste quantities that include Hanford Only generated waste in addition to varying amounts of offsite waste. This evaluation reflects the uncertainty in waste quantities that Hanford might receive under WM PEIS decisions for MLLW, LLW, and TRU waste. The inclusion of a Hanford Only waste volume provides the basis for determining the incremental impacts of offsite waste.

12 DOE's basis for regulation of DOE LLW is set out beginning at p. A-152 of Appendix A of the "Implementation Guide for use with DOE M 435.1-1." Appendix A can be accessed at URL: http://www.directives.doe.gov/. Appendix A states that:

"The regulation of low-level waste at DOE facilities, as developed in DOE Order 435.1, differs from the more generic but prescriptive approach taken by the NRC in developing requirements for commercial facilities in 10 CFR Part 61 and other rules. 10 CFR Part 61 was developed with several known conditions that are specific to commercial waste and are not necessarily appropriate for DOE low-level waste. These differences include (1) NRC has a formal licensing process while DOE uses the Directives process; (2) NRC requirements are for generic but unknown facilities and locations; (3) commercial waste streams are well defined; (4) DOE processed spent fuel for spent nuclear material; (5) DOE disposes of low-level waste onsite, where practical, at facilities which have been operating for many years; (6) land use controls for DOE low-level waste disposal facilities are likely to extend into the distant future; and (7) the management structure for

Responses to Letter L090

Comments **Responses**

DOE complex-wide low-level waste management is well established. These factors lead to differences in waste management regulation and practices for DOE and NRC low-level waste disposal; however, the required level of health protection is essentially identical.

One specific result of the differences in the process used by DOE to regulate low-level waste is the approach to waste classification. The NRC developed a generic waste classification system for application to all facilities and all locations, which was based on a well-developed understanding of the characteristics of commercial low-level waste. The waste classification limits were developed from a performance assessment of generic low-level waste disposal facilities in various locations that was included in the Environmental Impact Statement for 10 CFR Part 61. The DOE approach places greater emphasis on site-specific decisions for site-specific conditions, and requires a site-specific performance assessment to develop limits, on the basis of criteria for radiation protection (dose limits) that are similar to the NRC. This approach recognizes that the locations for the disposal of wastes are well known, but the waste characteristics are not as well understood. DOE Manual 435.1-1 requires the development of waste acceptance criteria for each waste management facility to ensure justified limitations are placed on wastes to be disposed of. Sites may establish waste classifications as needed for operation of specific facilities, but they must establish waste acceptance criteria. This approach leads to the development of site-specific systems which take into account the environmental characteristics of the site and the characteristics of the wastes being disposed of, such as the Category 1 and 3 designations at Hanford, which are similar to the NRC classes A and C."

The HSW EIS proposed action and alternatives do not include disposal of TRU waste at Hanford. TRU waste stored in the Low Level Burial Grounds (LLBGs) will be shipped to WIPP.

13 DOE interprets the comment to be asking for information comparing current use of unlined disposal trenches to potential future use of lined and capped disposal facilities. The revised draft HSW EIS includes such comparisons.

The HSSWAC would be revised as needed, based on periodic performance assessment updates prepared during operations, to ensure that long-term impacts would not exceed established dose standards. The HSSWAC also incorporate requirements for greater confinement of higher-activity LLW and MLLW through disposal in high-integrity containers, or by grouting the waste in place in the disposal facility. (Please see Response 12.)

Responses to Letter L090

Comments	Responses
14	TRU waste will not be disposed of at Hanford. It will have been shipped to WIPP before closure, and thus does not require modeling. Other longer lived wastes were modeled but were found to not contribute significantly to doses after about 500 years. Therefore, the intruder scenario considered doses from 100 to 500 years.
15	Impacts 1 km down-gradient from waste sites and near the Columbia River were analyzed in the HSW EIS (see Section 5.3). The points of analyses used in the HSW EIS comparative assessment were located along lines approximately 1 kilometer downgradient from aggregate Hanford solid waste disposal facilities within the 200 East, 200 West, and the ERDF areas and near the Columbia River located down gradient from all disposal facilities. These points of analysis down gradient from the overall waste disposal facilities in each area are not meant to represent points of compliance but rather common locations to facilitate a more complete comparison of long term impacts from various waste management configurations and locations defined for each alternative.
16	The human health impacts from exposure to groundwater, which evaluate all constituents at the selected points of analysis, provide the best basis for the comparing Alternatives. The tables presented in Section 5.3 are meant to provide the reader with a summary of those constituents and waste categories that were closest to the benchmark maximum contaminant levels. Detailed tables of results are provided in Appendix G and show the relation of the estimated concentration of all constituents benchmark maximum contaminant levels.
17	This revised draft HSW EIS includes a revised purpose and need statement that was developed in consultation with EPA and Ecology staff. The statement includes disposal of existing and anticipated quantities of Hanford waste streams and potential wastes from offsite sources.
18	As required by the National Environmental Policy Act (NEPA) all comments received during the scoping period were considered in developing this HSW EIS. Appendix A in this HSW EIS provides a discussion on the disposition of the scoping comments. The alternatives considered in both the first and revised draft HSW EIS include activities that encompass a range of projected costs and environmental impacts. The revised draft HSW EIS also incorporates new alternatives suggested by commenters as well as recent proposals for waste management at Hanford that have been under discussion since the first draft was issued in April 2002. A number of events during the 4 years between public scoping and issuance of the first draft HSW EIS did affect the alternatives and document structure. For example, DOE incorporated evolving plans for nation-wide waste management by addressing the WM PEIS records of decision as they were issued, and as they related to solid waste

Responses to Letter L090

Comments	Responses
	management operations at Hanford. DOE also evaluated recent Hanford Site and nation-wide waste forecasts to determine whether the HSW EIS analyses needed to be updated to accommodate new waste volume projections. However, the basic scope of the document in terms of the types of actions evaluated, analyses performed, and impacts considered did not change sufficiently that additional scoping input was required. Comments received on the first draft HSW EIS and the scoping comments on the proposed ILAW SEIS were considered in the development of this revised draft HSW EIS.
19	In both drafts of the HSW EIS, DOE summarized all analyses in the body of the EIS and reserved more technical detail for the appendixes.
20	Thank you.
21	The HSW EIS alternatives incorporate elements of some initiatives considered as part of the Performance Management Plan for the Accelerated Cleanup of the Hanford Site (HPMP, DOE/RL 2002). In some cases, detailed evaluation of proposals may be deferred to future NEPA documents because they are not ready for decision at this time.
22	Like the disposal requirements contained in the RCRA, waste acceptance criteria applicable to disposal of DOE wastes are referenced in this HSW EIS, as appropriate.
23	Treatment technologies are identified in the text boxes in Section 2. The same technologies would be used in either a modified T Plant or a new waste processing facility. General technologies have also been identified for each of the waste streams in Section 2.1 Final selection of specific technologies will need to wait until detailed design of the facilities.
24	The revised draft HSW EIS has been revised extensively in response to comments. Summary information on the WM PEIS and its RODs is included in Section 1.0 and in Appendix B of this CRD. Appropriate references are made to the WM PEIS throughout this HSW EIS.
25	High-level waste has been added to the definitions of waste types in Section 1.0. Definitions for all waste types are included in the glossary.

Responses to Letter L090

Comments	Responses
26	Mixed waste management is discussed in some additional detail in Sections 2.1.2, 6.3, and 6.4 of this HSW EIS. This HSW EIS provides additional information on RCRA waste management practices for MLLW, including liners, groundwater monitoring, and permit requirements. The radiological components are regulated in the same way whether they are in MLLW or LLW.
27	Wastes not evaluated as part of the proposed action and alternatives in this HSW EIS are analyzed as part of cumulative impacts (see Section 5.14 and Appendix L in Volumes I and II of this EIS).
28	The definitions of TRU waste and suspect TRU waste are clarified in the revised discussion in Section 2.1.3 in this HSW EIS. As part of the Hanford Defense Waste (HDW) EIS, DOE decided to retrieve TRU waste stored in the LLBGs. For the purposes of analysis in this HSW EIS, it was assumed that 50% of the suspect TRU waste in the LLBGs is actually TRU waste. The TRU waste fraction was assumed to be packaged and shipped to WIPP.
29	Appendix B in Volume II of the HSW EIS contains assumptions for verification by waste type and alternative and are generally presented in Tables B.4 through B.12. For example, for Category 1 LLW, a 5% fraction of the contact-handled (CH) Category (Cat) 1 LLW in drums and boxes will be selected for verification at WRAP. A 5% fraction of the CH Cat 3 LLW in drums and boxes will be selected for verification at WRAP. A 10% fraction of the CH MLLW currently stored or received in a form suitable for disposal will be sent to WRAP for verification. For CH inorganic solids and debris, 10% of the waste will be verified at WRAP.
30	Commercial non-thermal treatment capacity, like macroencapsulation, is currently available and DOE uses it to some extent. Commercial thermal treatment capacity is limited at this time. This EIS evaluates alternatives for both onsite and offsite treatment of these wastes.
31	Additional alternatives have been evaluated and discussion of impacts has been substantially expanded in this revised draft HSW EIS (see Section 5.3 and Appendix G for groundwater impacts, Section 5.11 and Appendix F for human health effects, and Section 5.14 and Appendix L for cumulative impacts in Volumes I and II of this EIS). Most action alternatives analyzed in this EIS do not exceed the MCLs or applicable regulatory standards. By the time the waste constituents from this action are predicted to reach groundwater (100s of years), as projected and shown in the concentration-versus-time figures in Section 5.3, they will not exceed the concentration levels (or the dose limits), because the existing groundwater concentrations will have decreased by then. Therefore, the cumulative groundwater impacts from the proposed action would not exceed applicable regulatory standards (or the MCLs).

Responses to Letter L090

Comments	Responses
32	DOE welcomes comments from all parties on this HSW EIS.
33	Additional discussion of conceptual decontamination and decommissioning activities and long-term stewardship are included in this HSW EIS. Final resolution of the waste facilities (which would include the surveillance and maintenance activities) will be addressed as part of the overall Hanford 200 Area environmental cleanup, closure, and stewardship programs (see Section 2.6 in Volume I of this HSW EIS).
34	In this HSW EIS, DOE addressed the uncertainty in waste volumes by addressing a range of potential waste quantities that could be managed at Hanford. This range encompasses quantities representing waste from Hanford and offsite generators. (Refer to waste volume discussion in Section 3.0 of Volume I in this HSW EIS. Other uncertainties are discussed in Section 3.5 of the same Volume.)
35	As of February 1, 2003, DOE had met 99% of its TPA milestones on or ahead of schedule. However, this type of information is not needed in the body of this EIS for the purposes of evaluating the proposed action and alternatives. DOE has made information on cleanup at Hanford available electronically at http://www.hanford.gov/doe/progress/progress.htm. This web site includes information on meeting TPA milestones. Further information on the TPA is available at URL: http://www.hanford.gov/tpa/tpahome.htm.
36	The cumulative impacts analysis addresses initial results of the System Assessment Capability (SAC) analyses, which were based on available data and assumptions about waste inventories in various waste sites at Hanford. Various disposal records, process information, and groundwater/vadose zone monitoring data were used to estimate the inventories at these waste sites. (See Section 5.14 and Appendix L in Volumes I and II of this HSW EIS.)
37	These trenches are analyzed in the HSW EIS as part of Alternative Group B. The draft 2001 Environmental Assessment was mentioned because it would provide interim action coverage for construction of additional LLW disposal trenches within existing LLBGs to provide timely disposal capacity before completion of this HSW EIS. This was determined to be an allowable interim action during preparation of the HSW EIS consistent with 40 CFR 1506.1.
38	Pollution prevention and waste minimization are discussed in Sections 2.5 and 5.18 in this HSW EIS. NEPA documents related to this HWS EIS are discussed in Section 1.5. The WM PEIS and other NEPA documents identified in this HSW EIS evaluate alternatives for managing various DOE waste streams. DOE uses waste minimization methods where practicable to minimize waste management costs and to comply with RCRA waste minimization requirements.

Responses to Letter L090

Comments	Responses
39	Waste from the tank waste remediation program addressed in the HSW EIS includes ILAW, melters, ancillary equipment, and LLW and MLLW generated during operations of the tank farms and the WTP (as described in Sections 2.0 and 3.0 of the HSW EIS).
40	This HSW EIS evaluates various forecast waste quantities that include Hanford Only generated waste, in addition to varying amounts of offsite waste. This evaluation reflects the uncertainty in waste quantities that Hanford might receive under the WM PEIS decisions for MLLW, LLW, and TRU waste. The inclusion of a Hanford Only waste volume provides the basis for determining the incremental impacts of offsite waste. (Please see Response 11.)
41	The remaining uranium is included in the estimates bounded in this HSW EIS. See Section 2.2.3.4 in Volume I of this HSW EIS for a description of ERDF. This description includes a statement that the design of ERDF meets RCRA technical standards for a hazardous waste landfill.
42	The publication addressing the HSSWAC is the "Hanford Site Solid Waste Acceptance Criteria" (available at http://www.hanford.gov/wastemgt/wac/docs/hnf-ep-0063/hnf-ep-0063-7.pdf). In general, the verification frequency for onsite generators can be as low as 5% for LLW, TRU, mixed and TRU-mixed waste. Ten percent is the minimum for offsite generators. Appendix G of the HSSWAC document specifically deals with TRU waste certification requirements. Wastes that do not meet HSSWAC are treated at Hanford at the expense of the generators or they are sent back to the generators at their expense for treatment. When problems are found, the Performance Evaluation System is used to identify and implement corrective actions. More detailed information on waste acceptance can be found in Appendix G of the HSSWAC document. Verifiers at generators and Hanford are independent of site operators. The customer provides information concerning each waste stream on a waste profile sheet. The waste stream information is reviewed against the HSSWAC and the applicable waste specification record. If the waste stream information is sufficient and meets the applicable acceptance criteria, the waste stream is approved. New customers are required to submit a copy of their waste certification plan (or equivalent document) with the first waste profile sheet. In some cases, a site visit will be required for approval of this initial waste stream. On completion, the customer submits the waste profile sheet to their waste management representative. The waste management representative will coordinate all required reviews and return the approved waste profile sheet to the customer. After all required reviews are completed, the waste management representative will return the approved waste profile sheet package back to the customer. Customers must revise their waste profile sheet whenever the waste

Responses to Letter L090

Comments	Responses
	stream or generating process changes. In addition, waste profile sheets must be recertified annually.
43	Text has been added to Section 2.2.2.2 in Volume I of this HSW EIS to describe progress on the commercial demonstrations.
44	Information has been added to Section 2.1.3 in Volume I of this HSW EIS to discuss plans for receipt of RH wastes at the Waste Isolation Pilot Plant (WIPP).
45	WIPP has applied for changes to its permit to allow it to receive waste containing polychlorinated biphenyls (PCBs). EPA has indicated acceptance, but it is not final yet. Based on the assumption that the changes will be accepted, the sludge would not require treatment of PCBs.
46	For this HSW EIS it was assumed that T Plant would begin processing wastes in 2016. See Table B.11 in Volume II of this HSW EIS for waste stream 12. Only some of the K Basin sludge might be stored in a water-filled pool in T Plant. Storage of K Basin sludge would not restrict the use of T Plant.
47	Please see Response 23.
48	DOE has recognized the advantages of this approach and is starting to implement this practice. A discussion of these advantages has been added to this HSW EIS (see Sections 2.2.3.1 and 5.18 in Volume I).
49	The environmental analysis and comparisons for all alternatives are presented in Section 5 and summarized in Table 3.5. Costs comparisons are presented in Section 3.0.
50	Additional information on barriers has been added to Sections 2.2.3.6, 3.1.6.2, and Appendix D. Assumptions used about infiltration rates used for the groundwater analysis are contained in Appendix G, Section G.1.1.1.
51	Correction made.
52	Alternative Group B includes a new waste processing facility and was developed specifically to address a non-thermal treatment option. Other options, including the preferred alternative, incorporate thermal treatment.
53	WIPP currently is accepting CH wastes. DOE has added information regarding WIPP plans for acceptance of remote-handled (RH) wastes in Section 2.1.3. TRU waste containing PCBs is discussed in Response 45.

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Comments	Responses
54	This revised draft HSW EIS discusses several of these options, including an ERDF-style mega-trench, various cap designs, and a range of volumes of imported wastes. The EIS also includes an expanded discussion of alternatives considered but not addressed in detail (see Section 3.0).
55	The revised draft HSW EIS now considers the use of mobile facilities for the processing and certification of TRU waste. See Section 3.1.4.3.
56	The HSW EIS now includes alternatives for disposal at ERDF. See Sections 3.0.
57	The impacts are greatest in the No Acton Alternative because no closure cap is placed over the facilities. See Section 3.0 for a description of the No Action Alternative. The time of peak concentrations for action alternatives are shown in figures in Sections 3.4.3 and 5.3.
58	Cost estimates are for life-cycle activities and are in constant 2001 dollars. No costs are discounted. Details of the cost estimates are contained in Appendix C of the Technical Information Document (FH 2002). Costs include post-closure activities, such as monitoring during the institutional control period. The HSW EIS analysis did not assume that caps are replaced.
59	The preferred alternative has changed as a result of new information added to the revised draft HSW EIS. Information supporting selection of the preferred alternative is included in Sections 3.4 and 3.5 immediately preceding the preferred alternative discussion.
60	The text was modified for clarification (see Section 4.2.2).
61	The Treated Effluent Disposal Facility (TEDF) takes treated waste from the Effluent Treatment Facility (ETF). The text in Section 4.2.2 has been modified to clarify this. Additional information on contamination in the burial grounds also has been added to Section 4.2.2.
62	See the Reader's Guide (in Volume I of this HSW EIS)for explanations of how and why scientific or exponential notation is used. Both metric and English units are provided in the text to assist readers.
63	The purpose of this section is to provide a current description of the environment that might be affected by the alternatives discussed in Section 3. The results of analyses performed to assess potential environmental consequences, or impacts, of implementing any of the alternatives are presented in Section 5. Cumulative impacts from other Hanford Site activities are summarized in Section 5.14 of this HSW EIS.

Responses to Letter L090

Comments	Responses
64	Mean sea level and sea level were intended to mean the same thing. The text has been revised to avoid confusion. Eolian is defined in the glossary (see the Reader's Guide in Volume I of this HSW EIS).
65	The text has been revised to date these earthquakes to achieve consistency in the text.
66	Details regarding background uranium in the terrestrial environment are documented in the Hanford Site Environmental Report 2001 (Poston et al. 2002). In addition, information on background radiation is provided in *Ionizing Radiation Exposure of the Population of the United States* (NCRP 1987).
67	Section 4.5.1.4 contains details on surface water quality. Additional information is in the Hanford Site Environmental Report 2001(Poston et al. 2002) and the Hanford Site National Environmental Policy Act (NEPA) Characterization document (Neitzel 2002).
68	The text has been modified to clarify the intended meaning.
69	The Hanford Biological Control Program controls the growth of deep-rooted vegetation over contaminated and potentially contaminated waste sites by conducting herbicide spraying and cleanup activities. The effectiveness of the program is directly related to the timeliness of herbicide application and removal of tumbleweeds, rabbitbrush, and sagebrush.
70	Neitzel (2002) reports no amphibians or water-reliant wildlife at West Lake. Applicable environmental impacts are discussed in Section 5.5 of the HSW EIS.
71	In response to the issues raised by this comment, refer to the Final Hanford Comprehensive Land-Use Plan EIS. The concept of agreeing to disagree on issues such as Tribal members' treaty rights allowed DOE and representatives of other governments and agencies to set aside differences and work together on the land-use planning process. Tribal governments and DOE agreed that the Tribal members' treaty-reserved right to take fish at all "usual and accustomed" places applies to the Hanford Reach of the Columbia River where it passes through the Hanford Site. However, they disagreed about the applicability of Tribal members' treaty-reserved rights to hunt, gather plants, and pasture livestock on the Hanford Site. Instead of delaying the completion and implementation of a comprehensive land-use plan for the Hanford Site, DOE and the Tribes have proceeded with the planning process while reserving the right to assert their respective positions regarding treaty rights. Neither the existence of the Comprehensive Land-Use Plan EIS, this HSW EIS, nor any portion of their contents is intended to have any influence on the resolution of the treaty rights dispute. The nature of concentrated human activities are described in Section 4.7.1.

Responses to Letter L090

Comments	Responses
72	Level of service for onsite roads is not expected to be reduced *The Impact of the Waste Treatment Plant Project on the Hanford Communities* (Perteet 2001) contains a detailed description of the ratings. (TWRS Section 5.10, Table 5.10.1)
73	Hanford's groundwater contamination has not been shown to affect the drinking water supplies of the Tri-Cities. The Washington State Department of Health and the Cities of Richland, Pasco, and Kennewick monitor these water supplies, which all meet the applicable standards under the Safe Drinking Water Act.
74	Thank you.
75	The Hanford Only waste volume has been added to provide a better comparison with the impacts of adding offsite waste. The incremental impacts of offsite waste are the difference between the Upper Bound and Hanford Only impacts for a given alternative and between the Lower Bound and Hanford Only impacts for a given alternative.
76	The impacts of activities not within the scope of the proposed action are discussed as part of cumulative impacts. The evaluation of cumulative impacts has been substantially expanded (see Section 5.14 and Appendix L in Volumes I and II of this HSW EIS).
77	Section 5.18.1 in this HSW EIS includes a discussion about potential groundwater mitigation measures. Specific discussion of the use of soil mounds over trenches as an interim measure to shed water has been included.
78	Assessment of waste streams resulting from cleanup actions are factored into the cumulative impacts analysis and in some cases are directly considered as part of the alternatives evaluated in this HSW EIS. For example, TRU waste from cleanup of the 618-10 and 618-11 Burial Grounds is part of the projected TRU waste volumes analyzed in all alternative groups. (For waste volumes and cumulative impacts, see Appendixes B and C, and Section 5.14 and Appendix L, respectively, in Volumes I and II of this HSW EIS.)
79	Retrieval of TRU waste from the LLBGs has already started. Shipment of TRU waste to WIPP has also started. Over one third of the TRU waste in the LLBGs is scheduled to be retrieved by 2006 (HPMP DOE 2002). No substantial releases are expected to occur before the waste is retrieved.
80	The basis for screening out plutonium (Pu) and other constituents in this analysis is described in detail in Appendix G, Section G.1.3.1. This assessment relied on estimates made by recently completed performance assessments and other analyses. Specific estimates of distribution coefficients for plutonium were taken from estimates described

Responses to Letter L090

Comments	Responses
	in the composite analysis (Kincaid et al. 1998). These estimates ranged from 80 to greater than 1980 mL/g, with a best estimate value of 200 mL/g. In this analysis, all plutonium isotopes were conservatively grouped in with other constituents that were categorized as strongly sorbed in Mobility Class 5 where the distribution coefficients were assumed to 40 mL/g or greater. As a part of the screening analysis, estimated travel times of contaminants within groups (3 (K_d = 1), 4, (K_d =10), and 5 (K_d =40) categories) through the thick vadose zone to the unconfined aquifer beneath the LLBGs were calculated to well beyond the 10,000-yr period of analysis. Cantrell and Serne (2002) summarize available K_d information on plutonium and note the quantity and quality of Pu adsorption studies conducted with Hanford sediment are much less than those available for many other contaminants of interest at the Hanford Site. Delegard and Barney (1983) conducted a series of Pu adsorption experiments on Hanford sediment at high base concentrations and variable concentrations of chelating agents. From their results, it was demonstrated that even at high base concentrations Pu adsorption was moderately high. Combination of high base concentration and high ethylenediaminetetraacetic acid concentration reduced Pu adsorption the most; however, even under these conditions significant adsorption occurred. Hajek and Knoll (1966) conducted Pu adsorption experiments on Hanford sediment from high salt acid waste consistent with some tank waste environment but not geochemical conditions expected for LLW or MLLW. Under these conditions, the K_d values for Pu were determined to be less than 1. In another study conducted by Rhodes (1952, 1957), K_d values for Pu were measured on Hanford sediment at different solution to solid ratios, variable initial Pu concentrations, and a range of pH values from 0.5 to 14. In general, these results indicate high Pu adsorption, except at very low pH. The results of Rhodes at low and high pH are not consistent with the previous results discussed. It is possible that the high K_d values determined by Rhodes resulted from precipitation as a result of the high initial Pu [stated to be Pu (IV)] concentrations used in the experiments. Based on the data available for Pu, it appears that Pu will be fairly immobile except at very low pH values or high ethylenediaminetetraacetic acid concentrations.
81	An expanded discussion of the long-term impacts between alternatives is presented in Section 5.3 and Appendix G in Volumes I and II of this HSW EIS.
82	Potential mitigation measures for addressing ecological impacts are described in the Biological Resources Management Plan (BRMaP) and the Biological Resources Mitigation Strategy (BRMiS), which are discussed in Section 5.18 of this HSW EIS.

Responses to Letter L090

Comments	Responses
83	The LLBGs were not affected by the 24 Command Fire. See Section 5.5.1 of this HSW EIS for a discussion of Area C, the 24 Command Fire, and the expected recovery of natural vegetation. Future fires may periodically occur and could impact natural vegetation. See Section 5.18 for a discussion of potential mitigation measures.
84	Methods for management of cultural resources that may be found during construction are discussed in Section 5.7 and potential mitigation measures are described in Section 5.18 of this HSW EIS.
85	The discussion of transportation has been added in Section 2.2.4, Section 5.8, and Appendix H in volumes I and II of this HSW EIS. The impacts of transporting waste to and from Hanford through the states of Oregon and Washington are included.
86	Commented noted; text revised.
87	This was the exact title of the milestone. However the EIS no longer addresses this information in this format.
88	These two statements refer to the 200 East and 200 West contaminant sources separately. However, because of the potential confusion, the revised EIS addresses this subject in a different format. (See Appendix G, Section G.2 in Volume II of this HSW EIS.)
89	The wording "environmental statement" is correct in both the text and reference. The environmental statement was prepared prior to the issuance of the Council on Environmental Quality (CEQ) guidance that introduced the term "environmental impact statement." This was consistent with the then-current practice of following the nomenclature in NEPA.
90	Change made.
91	These terms are standard and regularly used in the program. Changing them would likely cause other confusion.

Responses to Letter L090

Comments	Responses
92	The change has been incorporated.
93	The text has been modified.
94	In Section 5.5.1 of this HSW EIS has been changed to clarify the intended meaning. There are now two separate paragraphs: one each for crouching milkvetch and stalked-pod milkvetch. Each paragraph includes the statement... "Because...milkvetch is relatively common on the 200 Area Plateau,…"

3.2 State Agency Comments and Responses

3.2.1 Washington State Department of Ecology

Statement of

Mary Anne Wuennecke

Washington Department of Ecology

Nuclear Waste Program

Draft Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement

August 14, 2002

1 Everyone here is concerned about how the Draft EIS fits into the overall picture of Hanford cleanup, and the long-term effects on the Columbia Basin and the region. The Department of Ecology wants to be confident that Hanford's own legacy of waste and contamination is and will be managed safely. Only then can we consider adding to the burden. We need the same confidence that any additional wastes brought to Hanford will also be managed safely, both day-to-day and for the long term. Unfortunately, this EIS falls short on all counts.

On several fronts, we have increasing confidence in how Hanford's existing wastes and contamination are being managed:

- USDOE has started Construction on a large plant to treat Hanford's tank wastes, after a decade of false starts;
- Cleanup of contaminated soils and buildings all along the Columbia River corridor is progressing well, including spent nuclear fuel being removed from water basins near the river;
- Recent discussions between USDOE and its regulators have led to support in Washington, D.C., for increased funding to accelerate retrieval of tank wastes and buried transuranic wastes, and for increased focus on groundwater protection.

2 Washington State recognizes that the legacy of nuclear weapons production is a national, indeed an international, problem. We expect to send high-level and transuranic wastes *from* Hanford *to* other states for disposal. We have borne, and will continue to bear, the responsibility to dispose of wastes *at* Hanford. But we need to understand the consequences of all of these actions in a comprehensive way.

3 We had hoped that the Hanford Solid Waste EIS would contribute to our confidence both in how Hanford's waste is managed and in the safety and importance of Hanford's role in the overall cleanup of nuclear sites in the country. We are very disappointed, therefore, that the Draft EIS falls far short of the mark. It does not provide adequate information, clearly presented, to help us or the public address major issues. For example:

- 4 What is the net benefit or harm of importing additional wastes for storage, treatment or disposal at Hanford?
- 5 Are there much better alternatives to burying minimally-treated waste in shallow, unlined trenches?
- 6 What are the long-term costs and requirements for monitoring, maintaining, and preventing failures at, and radioactive releases from, waste sites, and how can we be confident that these activities will be effectively and accountably managed?
- 7 What is the rationale for continuing self-regulation by USDOE when the issue is not national defense but environmental protection?

Here are some areas where we find the Draft EIS so deficient as to warrant a major revision, followed by another round of public review.

Scope is too narrow

The Draft EIS essentially evaluates a limited range of near-term, alternative means to add some treatment capability and to dig waste-disposal trenches.

- 8 The Draft EIS assumes that the 1997 Waste Management Programmatic EIS adequately compared the effects of treatment and disposal facilities at various sites, but it did not. The Programmatic EIS relied on data now several years old and did not have available even the limited information about Hanford contained in the Draft Hanford Solid Waste EIS.
- 9 The Draft EIS assumes continued or increased off-site low-level waste and mixed low-level waste disposal at Hanford. It does not separately assess needs for disposing Hanford waste, in spite of widespread requests for such analysis during the scoping comment period.
- 10 The Draft EIS evaluates only the management of wastes owned by or coming to the existing Waste Management Program, touching only lightly on previously buried wastes, environmental restoration wastes, naval reactors, and other wastes disposed near the surface at Hanford.
- 11 The Draft EIS does not evaluate other options currently under active discussion, such as the lined, RCRA-compliant mega-trench for disposing of low-level waste, expanded use of the Environmental Restoration Disposal Facility (ERDF), or storing and treating transuranic wastes from other sites.

Impact analysis is too limited

12 The Draft EIS reaches conclusions without adequate data and analysis. It often fails to disclose what information is not known in arriving at conclusions.

- 13 The Draft EIS does not include sufficient data about groundwater contamination and movement at Hanford.
- 14 The Draft EIS does not include sufficient data about the extent and characteristics of wastes and contamination already in the ground at Hanford.
- 15 The analysis of cumulative impacts from the proposed treatment and disposal activities, in conjunction with other reasonably foreseeable actions at Hanford, is extremely limited and not credible based on the material presented.
- 16 The Draft EIS does not include data about the effects on the full range of plant and animal species, *n*or does it recognize USDOE's obligation to protect and restore priority habitat, even if it has been degraded by fire or pesticides.

Regulatory analysis is insufficient

17 The Draft EIS tends to ignore a number of regulatory issues.

- 18 The Draft EIS does not adequately address the challenges USDOE presently faces in complying with RCRA and state dangerous-waste regulations. The Tri-Party Agreement is designed to bring USDOE into compliance, but there is still a long way to go. The Department of Ecology does not support compounding compliance problems that already exist at Hanford.
- 19 The Draft EIS assumes a point-of-compliance/impact assessment that has no basis in regulations (1 km down gradient from burial ground).
- 20 The Draft EIS does not adequately address the requirement under Washington and federal laws that mixed waste be treated to the maximum reasonable extent.
- 21 The Draft EIS assumes continuation of USDOE's self-regulation for radioactive wastes without any discussion of alternatives or implications.
- 22 The Draft EIS reflects insufficient attention to consultation requirements under the Endangered Species Act.

Consideration of closure, long-term care and costs is very limited

23 The Draft EIS does not deal with such long-term activities as site closure, corrective action, monitoring, maintenance, and post-closure institutional controls. It also does not assess nor compare disposal alternatives or low and high volumes according to the long-term care requirements imposed by each, and the costs of meeting the requirements.

Responses to Letter L089

Comments	Responses
1	This revised draft *Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement* (HWS EIS) has been revised to address many comments regarding its scope and content. It is hoped that the information presented in this revised draft HSW EIS will address these concerns. Information responsive to the specific comments of this statement and the Washington State Department of Ecology (Ecology) comment letter (L095 in this document) are included in the individual responses.
2	This revised draft HSW EIS includes a more comprehensive discussion of the relationship of Hanford's waste management activities to those across the U.S. Department of Energy (DOE) complex. It also provides an expanded discussion of the consequences of alternatives considered in the HSW EIS as well as cumulative impacts of the alternatives in relation to other activities at Hanford. The consequences of HSW EIS alternative actions are presented in Sections 3.4 and 5 of the document.
3	This HSW EIS has a revised purpose and need based on stakeholder comments. Other major revisions are the inclusion of the immobilized low-activity waste product from the waste treatment program, evaluations of new and reconfigured alternatives, and additional information about the alternatives and their impacts.
4	This HSW EIS has been revised to evaluate a Hanford Only waste volume so that the incremental impacts of the receipt of offsite waste can be ascertained. The major benefit of importing offsite wastes to Hanford is that it may enable other generator sites that do not have the capability to treat these wastes, to be cleaned up sooner, thereby freeing up resources that can then be employed to accelerate cleanup at Hanford.
5	Additional alternatives for the disposal of waste in deeper lined trenches have been added to this HSW EIS.
6	DOE has developed and analyzed the costs for each alternative considered in this HSW EIS. The scope of the cleanup activity is expected to include maintenance of the leachate collection system, monitoring of the cap performance, and maintenance of passive administrative controls (signs/postings). Groundwater monitoring is conducted according to DOE Orders, the Resource Conservation and Recovery Act (RCRA) permit, and Tri-Party Agreement (TPA) requirements for the disposal areas, and will be expanded as necessary according to agreements between DOE and regulatory agencies to support future waste management operations. DOE is committed to meeting environmental regulations and standards now and in the future. The U.S. Environmental Protection Agency (EPA) and Ecology (under the Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] and RCRA) require monitoring, reporting, and record keeping. Thus, there is a legal requirement that DOE, or its successor entities, meet these requirements.

Responses to Letter L089

Comments	Responses
7	As noted in Section 6 of this HSW EIS, a number of DOE radioactive and radioactive mixed waste activities are subject to external regulation or oversight. The specific authorities of DOE under the Atomic Energy Act (AEA) of 1954, and the application of other external requirements to DOE activities, are established by Congress rather than by DOE. DOE is subject to external oversight through the application of many regulations, including the applicable requirements of CERCLA, RCRA, and State of Washington Dangerous Waste Regulations. It is not clear that external regulation of facility safety and worker protection at DOE sites would result in greater public or worker safety. For example, the Occupational Safety and Health Act (OSHA) has identified a number of safety and health hazards for which DOE currently enforces more protective safety and health standards than OSHA. Also, it is not clear whether safety practices would materially change. For example, DOE worker protection requirements currently incorporate many OSHA occupational safety standards. One of the conclusions in a 1999 NRC report (*External Regulation of Department of Energy Nuclear Facilities: A Pilot Program*, NUREG-1708) covering three pilot external regulation efforts of DOE facilities was that "few, if any changes in facilities, procedures, drawings, calculations, administrative process controls, safety programs, and safety documentation (including safety analysis reports) would be necessary. DOE initiatives such as WorkSmart Standards and Integrated Safety Management Systems could continue to be used under an NRC regulatory framework." A change to external regulation of facility safety and worker protection at DOE sites would require Congressional action including amendment of the AEA and OSHA. DOE has added alternatives that include disposal of LLW in lined trenches with leachate collection systems that meet RCRA and State substantive requirements.
8	The WM PEIS was a comprehensive evaluation of DOE nationwide waste management, and DOE determined there was sufficient information to make decisions regarding the sites that were suitable for long-term waste management missions. The WM PEIS was widely distributed, and documents cited in the WM PEIS were made available at numerous libraries and reading rooms in Washington and Oregon. Likewise, documents cited in this HSW EIS are available in public reading rooms listed in published notices and this document.
9	This HSW EIS has been revised to evaluate a Hanford Only waste volume

Responses to Letter L089

Comments	Responses
10	The scope of this HSW EIS has been revised to evaluate disposal of the immobilized low-activity waste generated by the Hanford Waste Treatment Plant (WTP). Other past buried wastes at Hanford are addressed as part of the cumulative impact analysis.
11	Disposal of waste in lined mega-trenches and use of the Environmental Restoration and Disposal Facility (ERDF) have been added as alternatives.
12	Additional discussion of limitations, uncertainties, and assumptions has been provided throughout this revised HSW EIS.
13	The text has been revised throughout the EIS to provide additional information about characteristics of disposed waste (e.g., Section 2.0, Appendix F, etc.) and groundwater movement (e.g., Sections 4.0, 5.3, etc.) to support conclusions.
14	Please see Response 13.
15	The evaluation of cumulative impacts has been substantially expanded (see Section 5.14 and Appendix L in Volumes I and II of this EIS).
16	Biological and ecological resources (vegetation, wildlife, aquatic ecology, and threatened and endangered species) potentially impacted by the proposed actions are assessed in Appendix I and summarized in Section 4.6 of this HSW EIS. Wildlife species evaluated and ecological resource impacts are summarized in Section 5.5 of this EIS. The natural vegetation is expected to be reestablished after closure of the disposal facilities and the borrow area. Potential mitigation measures for addressing ecological impacts are described in the Biological Resources Management Plan (BRMaP) and the Biological Resources Mitigation Strategy (BRMiS), which are discussed in Section 5.18 of this HSW EIS.
17	This HSW EIS was prepared for the purposes of National Environmental Policy Act (NEPA) analysis and decision-making. Basic descriptive information about regulatory programs is provided in a number of locations throughout this EIS, including Section 1.5.1 (TPA, RCRA, CERCLA), Sections 1.5.2 and 1.5.3 (NEPA), Section 1.5.4 (State Environmental Policy Act), and Section 2.1.2 (RCRA). Section 6 contains an extensive discussion of applicable regulatory requirements and permits.
18	DOE recognizes that the cleanup of Hanford is a complex effort and is committed to it through the TPA process. As of February 1, 2003, DOE had met 99% of its TPA milestones on or ahead of schedule.

Responses to Letter L089

Comments	Responses
19	The maximum point of impact from multiple and widely dispersed sources is not necessarily directly underneath the Low Level Burial Grounds (LLBGs) or at the LLBG boundary. To model the groundwater impacts from multiple and widely dispersed disposal units over long periods of time, a 1-km "point of analysis" location was deemed to be more appropriate and representative than a regulatory "point of compliance" well location. Current results from the RCRA-compliant groundwater monitoring have not identified any groundwater impacts from the LLBGs. The point of analysis approach is considered more technically appropriate for a NEPA evaluation of groundwater impacts. More specific clarification about the differences between the "point of assessment" used in the HSW EIS groundwater impact analysis and the RCRA "point of compliance" for land disposal unit groundwater monitoring wells is provided in Section 5.3 and Appendix G.
20	DOE agrees that mixed waste must be treated to applicable requirements of RCRA and the Washington State Dangerous Waste Regulations before land disposal at Hanford. The treatment of mixed low-level waste at Hanford is discussed in Section 2.1.2 of this HSW EIS.
21	Please see Response 7.
22	Presence alone of threatened or endangered species or critical habitat does not necessitate formal consultation under the Endangered Species Act. The U.S Fish and Wildlife Service (FWS) letter of April 23, 2002, (see Appendix I) states that "...if a listed species is likely to be affected by the project, the involved Federal agency should request Section 7 consultation...." According to the FWS Endangered Species Consultation Handbook, formal consultation is necessary 1) after the action agency determines that the proposed action may affect listed species or critical habitat, or 2) National Marine Fisheries Service (NMFS) or FWS does not concur with the action agency's finding that the proposed action is not likely to adversely affect the listed species or critical habitat. There are no threatened or endangered species or critical habitat in any of the terrestrial habitats to be disturbed under any of the alternatives in this HSW EIS (see Appendix I). Thus, because no threatened or endangered species or critical habitat are likely to be adversely affected, there is no basis for initiating formal consultation with either NMFS or FWS. Regarding documentation for State-listed species of concern we assume the comment meant the Washington State Department of Fish and Wildlife not the U.S. Fish and Wildlife Service. Table 4.12 in this EIS identifies the Washington State-listed animal species of concern. This information was obtained from the website: www.wa.gov/wdfw/. Based on information provided subsequently from the Washington State Department of Fish and Wildlife (letter dated August 20, 2002), this EIS has been updated. Also, please refer to the responses to the comments of the Washington

Responses to Letter L089

Comments	Responses
	Department of Fish and Wildlife (L096).
23	This HSW EIS has been expanded to address long-term stewardship. It expands upon the range and depth of alternatives analyzed, provides information describing accelerated cleanup plans and how they affect they affect the HSW EIS. The analysis also distinguishes between Hanford Only waste volumes and those projected to originate offsite. This HSW EIS considers post-closure institutional controls (see Section 2.0) and costs (see Section 3.5) in its analysis beyond 2046.

3.2.1 Washington State Department of Ecology
August 21, 2002

FC#	Section/Page Ref.	Category	Comment
1	Section 1.0, Page 1.1, Lines 4-7 Section 1.3, Page 1.3,Lines 18-20 Section S.2, Page S.1, Lines 23-25	Scope and Analysis	The Purpose and Need statement appears to support USDOE's complex-wide programmatic need to "enhance and expand management of its existing and anticipated volumes of . . ." While the Purpose and Need statement may reflect USDOE's need, it does not reflect the Washington State Department of Ecology's need. So that the Purpose and Need statement may reflect USDOE's and Ecology's needs, the following Purpose and Need statement is recommended: "USDOE needs to provide safe, protective, and RCRA-compliant waste management capabilities for existing and anticipated volumes of solid LLW, MLLW, post-1970 TRU, pre-1970 containing TRU, commingled-TSCA waste at the Hanford Site." (§ 1502.13)
2	Section S.3, Page S.2	Scope and Analysis	40 CFR Part 1502.12 requires the summary "to stress . . . areas of controversy (including issues raised by agencies and the public), and the issues to be resolved (including the choice among alternatives)." The section describes the scoping process followed for development of this environmental impact statement. The section indicates that USDOE "considered all of the comments received in its development of this Draft HSW-EIS." Ecology has commented on other associated NEPA documents such as the draft environmental assessment (EA) for trench construction and operation in the 218-E-12B and 218-W-5 Low- Level Burial Grounds (LLBG) (DOE/EA-1373) and the EA for the transuranic (TRU) waste retrieval in the 218-W-4B and 218-W-4C LLBG (DOE/EA-1405). Either in this section or somewhere else in the Draft HSW-EIS, it should be indicated whether USDOE considered Ecology's previous comments on related issues of environmental impact analysis. (§ 1502.12)
3	Section S.3, Page S.3, Lines 9-14 Section S.3, Page S.3, Lines 10-11 Section S.8.1, Page S.18, Line 13 S.3, Page S.3	Scope and Analysis	The Draft HSW-EIS states that the environmental analysis in the document was conducted through the year 2046, which represented the end of most waste management operations at the site. This resulted in a number of scope and boundary concerns including: ➢ The post-closure requirements for waste disposal facilities may extend beyond the end of active waste management (2046). ➢ Long-term impacts to groundwater and the Columbia River were evaluated for 10,000 years. How do these ranges compare to the half-lives of the radiological contaminants in question? How long before decay renders these contaminants non-radioactive?
4	Section S.3, Page S.3, Lines 10-11 Section 2.2.3.2, Page 2.26, Lines 13-20 Figure 2.15, Page 2.27	Scope and Analysis	It appears that closure actions and impacts have only been partially included and analyzed in the Draft HSW-EIS. While the Draft HSW-EIS evaluates and bounds consideration of managing wastes in the LLBG, the evaluation is not complete as it does not include a bounding evaluation/analysis of impacts and/or costs of closure (i.e., disposal). The LLBG are permitted as disposal units. As such, disposal is a function of waste management. Similarly, closure is a function of waste management at the LLBG. Therefore, to omit an impact analysis of closure actions and/or costs renders the analysis incomplete and does not provide decision-makers the needed information to make decisions regarding the Draft HSW-EIS at Hanford. Specifically,

			the Hanford Barrier (an aboveground, multi-component barrier that prevents the entry of rainfall, plant roots, or burrowing animals into the area covered by the barrier) design was assumed a bounding design for analysis purposes. Likewise, the use of the Hanford Barrier was assumed a bounding action (i.e., in-place closure) for analysis purposes. To even partially omit closure action impact and/or cost analysis in the Draft HSW-EIS for disposal units for which protective barriers are regulatory requirements renders the analysis deficient, incomplete, and non-bounding. (§ 1502.14,1502.15, and 1502.16)
5	Section S.3, Page S.3, Lines 39-41	Scope and Analysis	Clarify if the maximum forecast receipts represents existing Hanford (i.e., on-site) TRU wastes or if the forecast includes receipt of off-site TRU wastes. If the forecast includes receipt of off-site TRU wastes, it is recommended that either the reader be referred to the location in the Draft HSW-EIS where a description/explanation of "maximum forecast receipts" may be found or that the text be clarified. (§ 1502.7)
6	Section S.4, Pages S.4 -S.6 Section S.4, Page S.4 Figure S.2 Table S.1, Page S.11 Section 1.0, Page 1.1, Lines 18-20 Section 1.2, Page 1.3, Lines 5-6	Scope and Analysis (TSCA)	The *Hanford Site Solid Waste Management Environmental Impact Statement Technical Information Document* (HNF-4755) indicates that waste types covered in the Draft HSW-EIS include TSCA regulated waste (i.e., waste containing polychlorinated biphenyls [PCB], asbestos, or other such regulated components). A number of sections of the Draft HSW-EIS do not appear to identify this waste type. The Draft HSW-EIS and the supporting basis (technical information document) must agree on scope. The text should explain this difference between the Draft HSW-EIS and the supporting information document and explain how the difference was addressed in the Draft HSW-EIS. Due to the use of waste streams for which definitions are not included, the reader cannot discern what waste types are included in the Draft HSW-EIS. (§ 1502.7,1502.14)
7	Section S.5.2, Page S.9, Lines 3-12	Scope and Analysis	It is indicated that USDOE does not currently have facilities for treating several significant waste streams. It is also indicated that "proposed new facilities are included in the Draft HSW-EIS to provide capabilities for waste treatment and processing." From the indications, it is unclear whether the Draft HSW-EIS EIS bounding analysis includes potential impacts and costs associated with the proposed new facilities. If the reader is not provided information regarding conceptual plans, design phases, funding profiles, etc. associated with the proposed new facilities, the reader cannot ascertain whether the analysis is bounding. In other words, it is difficult for the reader to determine if the "proposed new facilities" are included in the scope of the Draft HSW-EIS. Clarify, by identification, if the analysis is bounding by the inclusion of impacts and costs associated with the "proposed new facilities". Clarification may be provided by referring the reader to the appropriate location in the document where the information may be reviewed. (§ 1502.7)
8	Section S.6.1, Page S.10	Scope and Analysis	It is indicated that USDOE "needs to determine which . . . disposal activities are required for properly managing on-site and off-site solid LLW that currently exists, or that may be received at Hanford in the future." It is also indicated that USDOE "needs to evaluate options for permanent disposal of LLW at Hanford, including expansion and possible reconfiguration of disposal facilities to accommodate anticipated waste receipts." With so many decisions yet to be made, the wording

			does not instill confidence that the impact analysis and/or cost estimates included in the Draft HSW-EIS are either comprehensive or bounding. To clarify, include wording identifying/describing how the impact analysis associated with the LLW waste type is bounding. Also, for clarification, include a description of how the decisions will be made in the future (i.e., applicable authorities). (§ 1502.7)
9	Section S.6.1.2, Page S.10 Table S.1, Page S.11	Scope and Analysis	The *Hanford Site Solid Waste Management Environmental Impact Statement Technical Information Document* (HNF-4755) indicates that "DOE would treat Hanford's non-conforming LLW using off-site commercial facilities and dispose of this treated waste in the LLBG. The Draft HSW-EIS states: "Non-conforming waste would be treated to comply with the HSSWAC using existing on-site capabilities, or if on-site treatment capacity does not exist, it would be treated at an off-site commercial facility." Ecology acknowledges the financial status of the intended off-site commercial treatment facility. Due to the supporting technical information document's described alternative 1 off-site treatment, the Draft HSW-EIS should identify where the analysis of "enhancement" of on-site treatment facilities or construction of new on-site treatment facilities is included in the Draft HSW-EIS. The analysis should include environmental and cost impacts. (§ 1502.14, 1502.15, and 1502.16)
10	Section 1.4.5.1, Pages 1.11 – 1.12 Section S.6.1.3, Page S.12	Scope and Analysis	Section 1.4.5.1, Pages 1.11 – 1.12. The section describes the three alternatives analyzed for LLW management at Hanford. The No Action alternative appears to contain "action" as indicated by the following: "DOE would construct new disposal capacity using a trench design similar to that previously employed for disposal of LLW at Hanford. Disposal would take place within the boundaries of currently defined LLBG." Similarly, the receipt of the disposal volumes identified and the construction of new trenches could be argued to constitute "action." The reader can neither determine if an environmental impact analysis has been performed for the "currently defined LLBG" nor discern why a No Action alternative would appear to contain "action." Therefore, provide an explanation and the basis for inclusion of additional waste receipt and trench construction in the No Action alternative. (§ 1502.7, 1502.14)
11	Section 5.1, Pages 5.3 – 5.5 General Comment	Scope and Analysis	The land use section does not include sufficient explanation to allow the reader/decision-maker to understand the supporting technical basis/analysis associated with the various scenarios/alternatives. To explain, Table 5.1 lists upper and lower bounds for alternatives 1 and 2. If the land use areas are compared between "area designated for LLBG," "area currently occupied," and upper and lower waste volume bounds there is no explanation for why the numbers are significantly different. For example, for 218-W-3A, the number of 20.4 is the same for all alternatives which may indicate that the entire LLBG which is currently being used in full capacity will be capped as a disposal site. However, for 218-W-3AE, the number of design area (20) is different from current occupation area (12) which is different from upper and lower bound numbers (12.2). The section lacks explanation for the reader/decision-maker to understand what the land use numbers mean under the various scenarios and alternatives. (§1502.7)
12	Appendix D	Scope and Analysis	LLBG unit 218-W-5 contingency expansion has been omitted from the appendix.

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	General Comment		Similarly, the analysis of borrow pit resources does not include the resources needed in relation to LLBG unit 218-W-5. Similarly, the *Hanford Site Solid Waste Management Environmental Impact Statement Technical Information Document* (HNF-4755) appears to have omitted analysis for LLBG unit 218-W-5. Therefore, the analysis is incomplete and non-bounding. The analysis should either be included in the Draft HSW-EIS or the Draft HSW-EIS should clearly identify that it is not included and should the contingency expansion be necessary in the future, an additional NEPA evaluation will be performed. (§1502.7, 1502.14, 1502.15, 1502.16)
13	General	Scope and Analysis	CWC and WRAP have large amounts of data stored in SWITS, etc. Where LLBG and T-plant have large data gaps. These data groups, as TSDs, should be described separately and their impacts calculated separately due to the available data.
14		Scope and Analysis	In Section 5.3 and Appendix E, compliance with the ambient air quality standards was shown through the following method: The pollution generated by each project was calculated, then based on the timeline of the projects, the year of maximum pollution generated was determined and the pollution generated calculated. The concern with this approach is the assumption that the projects will occur in the year stated; the possibility that projects may be delayed or start early is not addressed in this calculation. This same method was used to compare the alternatives to each other. The total pollution generation over the life of the alternative should be calculated and these total values should be used to compare the alternatives to each other, not the pollution generated in one year, the assumed maximum year.
15	Sec 1.4, Page. 1-5 Section S.3, Page S.3, Lines 37-39	Scope and Analysis	On February 16, 1996, Ecology provided comments to USDOE on the WM PEIS. A major conclusion was that the Draft PEIS failed to provide the whole picture and, as a result, Ecology requested an analysis of cumulative impacts on a site-by-site basis. On January 30, 1998, Ecology provided comments on the scope of the Draft HSW-EIS that identified the need to establish a baseline for solid waste at Hanford. The Draft HSW-EIS, Sec 1.4, alternatives, states that public comments received on the Draft HSW-EIS NOI also encouraged USDOE to focus on Hanford wastes and to understand the impacts from management of those wastes separately from the impacts of accepting additional off-site waste. However, USDOE states that, "The structure of the alternatives . . . did not lend itself to conducting such an analysis. Ultimately, USDOE considered alternatives by waste type." Ecology requests that USDOE analyze cumulative impacts on a site-by-site basis and assess the impact of waste already at Hanford separately from the impacts of waste being received. (Cumulative impacts)
16	S.1 Table S.1, Page S.11 Section S.3, Page S.3, Lines 18-24 Section S.4, Page S.6, Lines 11-33 Section S.4, Page S.6 Section S.5, Page S.6 Section S.5.3, Page S.9, Lines 33-35 Section S.6, Page S.6 Section S.6, Page S.10 Section 1.0, Page 1.1, Lines 18-20	Scope and Analysis	The exclusion of pre-1970 TRU waste from this analysis is inappropriate. USDOE has less certainty of the characterization and ultimate environmental impacts of the wastes that were directly buried in the LLBG unlined trenches decades ago. The uncertainties with regard to characterization of these older waste streams should be predominantly considered in the overall analysis of the proposed action. (Scope, uncertainty, cumulative impacts, long-term stewardship)

	Section 1.2, Page 1.3, Lines 5-6		
17	S.4, Figure S-2	Scope and Analysis	Was TRUM (transuranic-mixed waste) considered and analyzed in the scope of this Draft HSW-EIS? If so, Ecology requests that USDOE indicate under which category those waste streams were considered. If not, USDOE needs to reconsider given the management and impact of TRUM wastes. (Scope)
18	S.4, Figure S.2	Scope and Analysis	Under the Low-Level Waste box is a category entitled "Previously Buried Waste in the LLBG." From the perspective of applying a regulatory definition, the designation of this waste as "low-level" is correct. However, as the Draft HSW-EIS states on page S.5, "Until 1987, MLLW was managed in the same manner as LLW." In other words, even though dangerous waste constituents were likely to have been present to some unknown extent in this waste stream, USDOE was not obligated to manage the waste as dangerous waste because RCRA was not yet applicable to mixed waste. The importance of this distinction from an environmental perspective is that the waste defined as "low-level waste previously buried in the LLBG" should be significantly considered with regard to the existence and impact of dangerous waste constituents in the LLBG. (Scope, cumulative impacts)
19	S.8, Page S.17	Scope and Analysis	Ecology disagrees with the statement that "For most resources, little or no impact would occur as a result of implementing any of the alternatives." Given the fact that the current situation at Hanford is ill-defined with regard to what has been placed in the ground (i.e., lack of characterization for tank waste, burial grounds, cribs/ponds/ditches) and the current behavior of the waste (i.e., leaking, leaching, moving), it is irresponsible to assume that the addition of more than 30 million cubic feet of waste at Hanford will have little or no impact on the environment. (Ecological analysis, uncertainty analysis, groundwater analysis)
20	S.8.2, Page S.18	Scope and Analysis	Transportation considerations were not made for shipment of low-level waste or TRU waste to Hanford. However, USDOE stated that in the WM PEIS, they considered that, "Under MLLW Alternative 1, some MLLW would be shipped from Hanford to an off-site treatment facility and returned to Hanford for disposal. As a bounding case, a treatment facility in Oak Ridge, Tennessee, was assumed for purposes of this transportation analysis. Transportation of waste was determined to result in up to four fatalities." Why would USDOE choose an alternative that was determined to result in up to four fatalities? (Ecological analysis)
21	S.8.3, Page. S.18	Scope and Analysis	USDOE states that health impacts were estimated from radionuclides and chemicals that could eventually leach from waste disposed at Hanford and reach groundwater and ultimately the Columbia River. However, uncertainties exist as to the characteristics and volumes of waste that have already been placed (or released) into the ground at Hanford, particularly in the early years to unlined trenches, cribs, ditches, and then via leaky underground storage tanks. Again, there is a need to understand the existing impacts of Hanford's situation separate from the impacts of additional waste from throughout the USDOE complex. (Scope, long-term stewardship)
22	Sec. 5.3.2, pp. 5.13 ff	Scope and Analysis	Please explain: (1) The exclusion of pre-1962 buried wastes from the calculation of long-term impacts; and (2) The means/sources by which 1962-1988 wastes were characterized, particularly with regard to hazardous chemical constituents.
23	Appendix A pp. A.4-A.5	Scope and Analysis	The first comment under A.1.2 is barely acknowledged, and certainly not "dispositioned" by the response on p. A.5. The WM-PEIS did not compare

			environmental impacts of disposal of specific volumes and streams of LLW and MLLW at specific sites. Yet the Draft HSW-EIS assumes that the decision has been made and, therefore, provides no basis to compare impacts of disposal at Hanford with disposal at other specific sites.
24	p. A.8	Scope and Analysis	There is an apparent contradiction in lines 6-12. Please explain why "[s]ome waste that may be generated at Hanford and other USDOE facilities would not be suitable for disposal at commercial facilities under existing permits and regulations," but "regulations governing disposal of USDOE waste have historically been similar to those for commercial facilities."
25	p. A.8	Scope and Analysis	Please clarify the parenthetical statement in lines 9-10 to acknowledge that pre-1970 wastes disposed within designated Solid Waste Management Units pursuant to ____ will be subject to closure and corrective action provisions of ____. Further, please acknowledge that retrieval actions that include transuranic wastes will result in additional wastes to be stored, treated, characterized, packaged and shipped to WIPP for disposal.
26	p. A.9	Scope and Analysis	Please explain the claim that impacts of disposal of wastes in canyon facilities would be bounded by assessment of impacts of disposal in burial grounds. Are packaging, migration pathways, interaction with adjacent wastes and contamination, emissions during construction and operation, etc., all the same as or less than burial ground disposal?
27	pp. A.12-A.13	Scope and Analysis	The lower bound estimates based on the SWIFT forecast are not responsive to the commenters' requests for a Hanford baseline, because they assume continued disposal of off-site waste.
28	pp. B.19-B.23	Scope and Analysis	All options for contact-handled TRU waste (CH-TRU) assume that retrievable waste will be characterized in-trench and that 50% will be determined to be LLW and left in the trenches. Please explain (a) how in-trench non-destructive characterization will meet regulatory requirements for waste analysis and acceptance; and (b) the basis for the 50 % estimate.
29	Table C.1, pp. C.3-C.4-C.5-C.6	Scope and Analysis	1. It appears that the Hanford volume includes wastes already disposed from off-site and on-site generators. Please clarify that this is the case. 2. Please explain the selection of smaller volume (78,883 m^3) of waste for Oak Ridge as the upper bound for the USDOE comparison, as the potential volume appears much larger in Table C.1. Please explain the origin of the estimates, as Oak Ridge was apparently not consulted (not listed as off-site forecasted waste generator or potential off-site generator, per p. C.5-C.6.) 3. Please explain the basis for estimating isotopic and chemical content of speculative volumes included in upper bound estimates in Table C.1.
30	Sec. C.4, p. C.8	Scope and Analysis	The discussion of TRU waste volumes should be expanded to deal with the following: • Distinguish between CH and RH TRU. The management, storage, packaging, transport and disposal requirements for the two categories are different, and the analysis requires distinguishing the two inventories. • Relationship of these volume estimates to (a) WIPP capacity, given that the National TRU Waste Management Plan (Rev. 2) anticipates less than 15,000 m^3 combined of TRU from Hanford, and (b) the Hanford TRU Disposition Map (IPABS-IS (8/28/01) which projects a WIPP disposal volume of 24,731 m^3.

31	Table C.2, p. C.4	Scope and Analysis	Please explain the discrepancy between the "previously disposed" figure for LLW (283,067 m^3) and the estimate contained on p.13 of the Information Package on Pending Low-Level Waste and Mixed Low-Level Waste Disposal Decisions under the PEIS and derived from the 1996 Integrated Database (640,000m^3).
32	Appendix H	Scope and Analysis	As USDOE is actively considering use of rail transport for inter-site shipments, please include an analysis of the potential impacts of rail shipment and/or inter-modal transfer of TRU, MLLW and LLW on-site.
33	Section 1.5.3., Page 1.23, Lines 26-38	Scope and Analysis	Reference is made to the June 2000 Environmental Assessment for Disposition of Surplus Hanford Site Uranium. The draft refers to 825 MTU which is to be stored in the 200 area pending final decision about its disposition. Assuming it is USDOE's intent to dispose of the material in the LLBG, is this material included in the inventory of wastes to be disposed? Is it included in the source term for assessment of long-term impacts? If so, how does it affect the finding in the WM-PEIS that for larger volumes of disposal of LLW at Hanford, groundwater standards for U-238 would be exceeded (WM-PEIS, p. 11-34)?
34			On page 1.5, under **Operational Period**, in line 12, LLBG closure is to take place after 2046. Will any type of interim cover be placed on top of the LLBG? Why can't USDOE use a close-as-you-go approach for the LLW trenches that apparently will be used for the MLLW trenches? This close-as-you-go approach may be performed on individual trenches or on a group of trenches.
35	Chapter 4; Section 4.4.	Scope and Analysis	Some mention should be made of the depth distribution of earthquakes. Most in and around the Hanford Site are shallow (i.e., < 15 km--including the swarm events), but there are a few deeper events in the Horse Heaven Hills (and elsewhere).
36	Chapter 4; Page. 4.34, Paragraph 1.	Scope and Analysis	Additional information would be helpful, such as the date of installation of the strong motion accelerometers, the trigger levels, and whether any of these facility accelerometers have ever triggered because of an earthquake.
37	Page. S.20	Scope and Analysis	Reference should be made as to the basis of these costs and how and where they are presented in detail.
38		Scope and Analysis	Reference is made to a Design Basis Earthquake. Section 4.5 does not contain any recurrence curves or indicate the manner in which the Design Basis Earthquake was selected and the free-field ground motion likely to occur at the LLBG sites as a result of this earthquake. Please correct.
39	Chapter 4; Page. 4.37, Sect. 4.5.2, Paragraph 3	Scope and Analysis	Leaking raw water lines have provided significant artificial recharge to the ground in the 200 Areas. Some of these unneeded raw water lines are being cut and capped and others are being pressure tested to assure integrity. However, until this process is accomplished throughout the 200 Areas, these old raw water lines that have exceeded their design life will continue to provide artificial recharge to the soil, and this can be a problem in the vicinity of waste management facilities. Please address.
40		Scope and Analysis	On page 1.8, line 19, "other solid waste" is mentioned. Please give examples of solid wastes that are outside the scope of this Draft HSW-EIS.
41		Scope and Analysis	On page 1.11, line 36, the Draft HSW-EIS mentions "other suitable locations," but does not provide any criteria for such a location.
42	Section 1.4.4.1, Page 1.9 Section 1.4.4.2, Page 1.10, Lines 24-25 Section 1.4.4.2, Page 1.10, Line 34 Section 1.5.1.2, Page 1.15	Inadequate Regulation	Throughout the Draft HSW-EIS, the text is incomplete or silent on RCRA regulatory authorities for waste management facilities in particular with regard to the LLBG, but also to other facilities such as T-Plant, CWC, WRAP, LERF, ETF, etc. Waste management, permitting, closure and post-closure requirements for RCRA TSDs

	Section S.4, Page S.6, Lines 25-26 Section S.5.2, Page S.8, Lines 21-22 Section S.5.2, Page S.8, Lines 31-32 Section S.6.1, Page S.10 Section S.6.1.1, Page S.10, Lines 29-31 Section S.6.1.2, Page S.10, Lines 41-42 Table S.1, Page S.11		and waste management units are not identified. Corrective action authority to address releases from regulated facilities is unclear. Extensive revision of a number of sections within the document are needed to accurately reflect the regulatory environment. Without clarity on RCRA applicability and extent, bounding conditions cannot be properly established and thus alternatives cannot be adequately evaluated.
43	Section S.6.1.3, Page S.12 Section S.6.2.3, Page S.13 Section S.6.3.3, Page S.15	Inadequate Regulation	The section does not identify that the No Action Alternative would not enable USDOE to comply with the waste management and land disposal restrictions of the State Dangerous Waste Regulations including RCRA requirements. Similarly, the section does not identify that the No Action Alternative may not enable USDOE to comply with their own policy for disposal of LLW wastes. Either in this summary section or in another summary section, the affects of non-compliance should be disclosed. Note: the *Final Environmental Impact Statement for the Tank Waste Remediation System Summary* (DOE/EIS-0189F) includes such a disclosure for the No Action Alternative (see page S-38). (§ 1502.7)
44	Section 1.5.1.1, Page 1.15, Lines 14-16 Section 1.5.1.2, Page 1.15 Section 1.5.1.2, Page 1.16, Lines 1-12 Section 6.3, Page 6.2	Inadequate Regulation	The Draft HSW-EIS describes coordination between RCRA and CERCLA regarding cleanup of past Hanford disposal sites giving a generic description of the HFFACO. While such coordination is desirable, it is not always achieved. To explain, the LLBG units are RCRA TSDs. As such, ongoing waste management, closure, post-closure, and corrective action will be decided upon via RCRA decision processes. In addition, the CERCLA cleanup schedule for the CERCLA-designated source operable units in which LLBG units reside, is scheduled to occur in or around 2024. However, LLBG units are currently planned to continue to be managed as active TSD units for at least two decades after 2024. The text should identify that the LLBG units are RCRA TSDs via which waste management, closure, post-closure, and corrective action will be permitted by the Washington State Department of Ecology via the state's RCRA authorization basis. (§ 1502.14(c))
45	Section 6.2, Page 6.2, Lines 7-8	Inadequate Regulation	Page 6.2, Section 6.2, Lines 7-8. Include an identification of other relevant HFFACO milestones. For example, identify that HFFACO Milestone M-20 includes a milestone for the submittal of LLBG unit final status permit applications. Similarly, identify that Milestone M-24 constitutes the HFFACO schedule for installation of RCRA groundwater monitoring wells. (§1502.7)
46	S.5.2.	Inadequate Regulation	The Draft HSW-EIS does not provide enough information regarding the evaluation of commercial treatment facilities. The Draft HSW-EIS also does not provide enough information as to the alternative of shipping wastes directly from their current location to the commercial treatment facilities, rather than routing the complex-wide wastes to Hanford for storage then again off-site for treatment. (Regulatory analysis)
47	S.5.3, Page S.9	Inadequate Regulation	Throughout the Draft HSW-EIS, USDOE builds on the assumption that the LLBG would "ultimately be closed by applying a cap consisting of soil, sand, gravel, and asphalt to reduce water infiltration and the potential for intrusion." Although capping the LLBG may be one viable alternative for consideration, it is certainly not the only one. Closure and post-closure decisions will be made, in part, based on the events

			that occur during operation of the unit, including any releases. Also, depending on releases or threats to human health and the environment during operation, corrective action may dictate closure and post-closure scenarios. Further, the final RCRA closure plan for the LLBG dangerous waste permit has not yet been completed, and final closure decisions have not yet been defined. Also, post-closure alternatives and their impacts were not presented in the Draft HSW-EIS. (Regulatory analysis)
48	S.6, Page S.10	Inadequate Regulation	On February 16, 1996, Ecology provided comments to USDOE on the WM PEIS. A major conclusion was that the Draft PEIS was not adequate to select sites within a conceptual alternative. Likewise, on January 30, 1998, Ecology provided comments on the scope of the Draft HSW-EIS that included the need to perform a systematic comparison of candidate sites. However, the Draft HSW-EIS, Sec S.6, Description of Alternatives, describes a very limited focus of alternatives, all of which consider only management of USDOE complex waste at Hanford. USDOE is encouraged to perform the comparisons as requested by Ecology, and then present the results and rationale to the public for review and consideration. (Regulatory analysis)
49	S.6, Page S.10	Inadequate Regulation	The LLBG is a RCRA TSD unit, with various problems associated with it, including characterization (or the lack thereof) of existing wastes that are buried and/or stored in the unit, the current and/or potential impact to the vadose zone and groundwater, and the associated ability (or lack thereof) to monitor these impacts. Compliance with RCRA requirements is required for management of wastes within this TSD. The proposed alternatives, limited as they are (see comment #10 above), need to consider the impacts on the LLBG from a RCRA TSD perspective, since the proposed addition of waste is within the boundary of a TSD unit with questionable integrity, e.g., USDOE needs to consider the alternative of creating a new space(s) for treatment, storage, and disposal of complex-wide waste so that the integrity and management of the waste stream(s) can be properly managed from the start, thus enhancing the ability and confidence for safe and compliant management. Ecology is not interested in compounding the problems for the LLBG, e.g., alternatives other than expanding an already questionable TSD should be considered. (Regulatory analysis)
50	Section S.6.3, Page S.14	Inadequate Regulation	USDOE states that "additional processing and certification capabilities must be developed and implemented at the Hanford Site" for meeting WIPP acceptance criteria. Please specifically identify what additional processing and certification capabilities need to be developed and implemented for wastes considered by this Draft HSW-EIS and identified for eventual disposal at WIPP. (Regulatory analysis)
51	Section S.6.3.1, Page S.14	Inadequate Regulation	Like LLBG, the T Plant Complex is a RCRA TSD unit. Compliance with RCRA requirements is required for management of mixed waste within this unit. Specifically, what modifications to the T Plant Complex are anticipated? How does this work fit in with the priorities already established and funded for processing Hanford wastes?
52	3.3.1, Page 3.6	Inadequate Regulation	USDOE states, "For purposes of analysis, this Draft HSW-EIS assumes that WIPP would have the necessary administrative and permitting authority to accept these wastes." This is an unfounded assumption given the fact that the current waste acceptance criteria for WIPP does not allow PCB's. Should the state of New Mexico decide at some point to modify the WIPP Permit and allow for the disposal of PCB waste, then that decision could be factored in at that time. However, for the

			purposes of this Draft HSW-EIS, analysis should be revisited with respect to and reflection of the current permitting requirements for WIPP.
53	p. A.12	Inadequate Regulation	Pre-1970 buried transuranic wastes that may be retrieved from burial grounds under CERCLA are outside the scope. Yet they may directly impact the need for facilities described in Sec. 3.3, and CERCLA decision schedules may not match schedules assumed in this Draft HSW-EIS.
54		Inadequate Regulation	On page 2.5, line 23, "cover and caps" are used. Are these equivalent terms? Caps are mentioned in the glossary, but covers are not.
55		Inadequate Regulation	The Nuclear Regulatory Commission (NRC) requires solidification/encapsulation media to be supported by a Topical Report (TR) approved by a governmental body. These TRs provide the technical information and testing necessary to ensure solidification media (e.g., certain types of concrete) and encapsulation techniques will be effective in the disposal environment. In the text box on page 2.6, cement and thermoplastics are mentioned, but not footnoted to show a TR (or equivalent document) documenting the materials' adequacy in the Hanford LLBG. Is there such a document showing the adequacy of cement and thermoplastics in the Hanford climate?
56		Inadequate Regulation	On page 2.23, the Draft HSW-EIS discusses the use of in-trench grouting and encapsulating the waste in concrete. Commercially, most of the nuclides that make up the Class A and B/C waste tables have limits based upon volume (and alpha emitters are based upon specific activity). The in-trench grouting volume is rather large by commercial standards. Does USDOE have an outside peer-reviewed performance assessment that indicates that radionuclide migration from the grouted structure will not exceed a regulatory dose limit (e.g., 25 mrem) over the next 10,000 years?
57		Inadequate Regulation	On page 6.11, line 12, the Draft HSW-EIS implies that USDOE will not always comply with USDOT regulations (i.e., Title 49 CFR) on roads to which the public does not have access. Is this correct? In the early 1990s at the annual LLRW convention in Las Vegas, a USDOE contractor representative committed to adhering to USDOT regulations for all shipments both on and off the Hanford Reservation. For shipments of radioactive (only) waste off-site, will the NRC's Uniform Manifest (e.g., NRC Form 540, 540A, 541, 541A, 542, and 542A) be utilized?
58	Section S.6.1, Page S.10	Inadequate Regulation	It is indicated that USDOE "needs to determine which . . .activities are required for properly managing on-site and off-site solid LLW that currently exists, or that may be received at Hanford in the future." It is also indicated that USDOE "needs to evaluate options for permanent disposal of LLW at Hanford, including expansion and possible reconfiguration of disposal facilities to accommodate anticipated waste receipts." The LLBG are solid waste management units (SWMUs). The Washington State Department of Ecology is authorized to implement RCRA corrective action for releases from SWMUs. To date, there are inadequate means for detecting releases from the LLBG (more detailed comments on this issue will follow) and there has been little to no characterization for potential releases from the LLBG. The Draft HSW-EIS does not reflect that RCRA corrective action decisions, if necessary, will be made by Ecology. Due to the lack of detection capabilities and contaminant release characterization information, for the Draft HSW-EIS to omit an acknowledgment of the uncertainties as well as the potential shared authorities

			associated with determining which activities are required for properly managing wastes renders the document incomplete. (§ 1502.14, 1502.15, and 1502.16)
59	Section 4.5.1.4, Page 4.36, Paragraph 4	Inadequate Regulation	Groundwater monitoring for the LERF, a RCRA TSD unit, is currently not occurring. So, the construction of the facility may be compliant, but it is not a totally compliant facility, as your statement implies.
60	Section 4.5.1.4, Page 4.37 Paragraph 1	Inadequate Regulation	Suggest changing the second sentence to read, "It is a Washington State permitted facility containing drain fields where tritium-bearing wastewater discharge is authorized in the permit.."
61	Chapter 4; Page. 4.37, Sect. 4.5.1.5, Sentence 2	Inadequate Regulation	Suggest inserting the word "historic" between "no" and "flood events." The 200 Areas Central Plateau is a flood bar deposited during Quaternary cataclysmic floods.
62		Inadequate Regulation	The text box on page 2.12 mentions that the floors will be sealed with impervious epoxy resins. Commercial industry experience indicates that this sealant is not permanent and requires repairs. Will the floors in these new buildings be inspected to find any "holes" in the sealant?
63	Specific	Ecological Assessment	*Page 3.13, Table 3.5, Comparison of Impacts Among the Alternatives*, In the Environmental Consequence Category under Ecological Resources, why was only the temporary Shrub-Steppe Habitat looked at? Besides vegetation/fauna there are biological aspects that need to be factored in. An encompassing vertebrate such as the Great Basin Pocket Mouse could be evaluated as well.
64	Specific	Ecological Assessment	*Page 5.22, Lines 13-16*, beginning with "To avoid impacts . . ." The planning in this scenario to avoid impacts is great. It benefits the reader of this Draft HSW-EIS to know that not everything is a detrimental effect to the complete ecosystem.
65	Section S.7, Page S.17, Lines 21-25	Ecological Assessment	Page S.17, Section S.7, Lines 21-25. Include an identification that shrub-steppe is considered a priority habitat by Washington State because of its importance to sensitive wildlife. (§ 1502.7)
66	Appendix I, Page I.1 Lines 15-18	Ecological Assessment	The document states that environmental impacts to the Columbia River would happen in the long term "up to 10,000 years post closure." The document does not provide a minimum time until impact would be seen on the river. Please provide the lower bound time frame for impacts of waste handing operation on the river.
67	Appendix I, Section I.2 , Page I.2	Ecological Assessment	The argument is made that due to the application of herbicide or effects of fires no priority habitats would be affected by any of the alternatives. The fact that a potential priority habitat was destroyed by fire or herbicide application is not justification for excluding that habitat from consideration of potential damages caused by construction of LLBG facilities. Not only must the current occurrence or state designated priority habitats be protected, but historic occurrence of priority habitats must be allowed to reestablish. Expansion of the facilities would necessitate expansion of the areas where spraying occurs and result in increased destruction of habitat. This impact is not assessed in the Draft HSW-EIS. The impact of an enlarged spray area should be assessed.
68	Appendix I, Section I.2, Page I.2	Ecological Assessment	The impact of blasting of bedrock as part of surface cover mining operations in the 300 Area on wildlife in the 300 Area as well as in the ALE is not assessed. The impact of the use of high explosives to excavate cover materials needs to be assessed.

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69	Appendix 1, Section I.2, Page 1.2	Ecological Assessment	No mention is made of surface microbiotic crust including algae, fungi, lichens, and mosses. The 1999 Nature Conservancy report *Biodiversity Inventory and Analysis of the Hanford Site*) states: "Although the ecological role of the macrobiotic crust within the shrub-steppe is not well understood, it clearly plays an important role in ecosystem functioning by reducing erosion, contributing nitrogen and organic carbon to the soil, and increasing infiltration of precipitation into the soil. Intact crusts can also enhance native seedling establishment in arid ecosystems (St. Clair et al. 1984), and may discourage invasion by non-native species such as cheatgrass." Therefore, the impact on this segment of the terrestrial ecosystem needs to be evaluated.
70	Appendix I, Section I.2 Page I.2, Line 22	Ecological Assessment	Several sections mention that due to fire or herbicide "priority habitats" would not be disturbed. The "priority habitat" moniker denotes the most important habitat to protect. Even if priority habitats are not affected, that does not mean that unmitigated destruction of habitats other than "priority habitats" can occur. The impact of actions to all habitats should be evaluated and documented.
71	Appendix I, Section I.2.1, Page I.8, Line 37-39	Ecological Assessment	This section states that a more comprehensive ecological survey of Area C will be conducted in the spring of 2002. The progress of that study should be updated and the results should be incorporated in this document. Without this information it is Impossible to make a determination on action proposed in this area.
72	Appendix I, Section I.3	Ecological Assessment	The criteria for selection of species used in the Ecological Contaminant (ECEM) model should be provided. The model allows for selection of many different food web components; the rationale for selection of these particular species should be provided.
73	Appendix I, Section I.3, Page I.9, Line 6	Ecological Assessment	The document references ECEM as the risk assessment model for ecological receptors. The model inputs and outputs should be provided so that the modeling process can be evaluated. Additionally the source and nature of the model should be provided. his model should be made available for evaluation by listing a contact or reference in the references. Upon consulting with USDOE-PNL it was determined that the information relating to the model parameters and algorithms is contained in the Columbia River Comprehensive Impact Assessment part 1 (DOE/RL-96-16, Rev 1, Final, U.S. Department of Energy, Richland, WA March 1998) this reference should be cited in the document.
74	Appendix I, Section I.3, Page I.11, Line 8-9	Ecological Assessment	Uranium is the only chemical evaluated for its non-radiological risk. The Groundwater Section 4 Table 4.9 lists chemical contaminates in groundwater including carbon tetrachloride, cyanide, chloroform, tetrachloroethene, and trichloroethene. These chemicals as well as other chemicals originating from the MLLW and TRU, such as PCBs, present a risk to terrestrial and aquatic receptors. The potential risk of toxic (non-rad) components of the MLLW/TRU needs to be evaluated.
75	Appendix I, Section I.3, Page 1.11, Line 15	Ecological Assessment	The statement is made that the risk assessment generally follows EPA ERAGS Guidance. Information should be provided on ways that it differs from EPA guidance.
76	I.3/I12/L,13	Ecological Assessment	This sentence states that "best" estimates were used to derive K_d values for soil and sediment. The scientific basis for the "best" estimates should be provided.
77	I.3/I.12/ L,2-5	Ecological Assessment	This sentence introduces a seep dilution term. There is some confusion about the dilution of groundwater by seeps. Seeps are defined as "Groundwater/Surface

			Water connections caused by river or stream erosion into a near-surface aquifer" (The Facts on File Dictionary of Environmental Science, Stevenson and Wyman 1991). An additional dilution factor for seeps is not appropriate due to the fact that a seep is a connection point between groundwater and surface water. This dilution factor should be removed.
78	I.3/I12/L,7-8	Ecological Assessment	This sentence states that soil concentrations are derived by multiplying seep concentrations by K_d. The K_d values are not provided in table I.2. K_d values should be provided as well as the basis for their derivation.
79	I.3/I.3/ Table I.3	Ecological Assessment	This table presents the EHQ for various receptors at or around the Hanford Site. The derivation of this data is not presented other than stating that it was developed using the ECEM model. The inputs and modeling assumptions should be presented.
80	I.3/I.13/I, 23	Ecological Assessment	A modifying factor of 15 was selected to convert acute mortality to a Lowest Observed Effect level. What is the rationale for the selection of 15 as a modifying factor? A commonly accepted modifying factor for acute to chronic is 10, but another factor of 10 would be assessed to go from chronic mortality to a chronic response other than mortality. Additionally, another factor of 10 would be assessed to extrapolate from Gambusia to species that inhabit the Columbia River and another factor of 10 might be added to account for interspecific variability. This would result in a modifying/uncertainty factor of 1,000 to 10,000. While this might be overly conservative, the data to support a MF/UF of 15, a conservative value, is needed. Even if the MF/UF was 100 the risk of Hanford plus background would exceed acceptable risk levels. This information section needs to be reanalyzed and re-evaluated to account for the degree of uncertainty associated with the toxicological values. Additionally, data sources for toxicological data should be presented.
81	I.4/I.14	Ecological Assessment	The "consultations" presented here are not formal ESA consultations as defined in Section 7 of the Endangered Species Act. They are merely the first step in a ESA section 7 consultation. These letters simply ask for a list of species that may be affected. Due to the fact that endangered species are present on the Hanford Site and in the Hanford Reach of the Columbia River, a formal ESA Section 7 Consultation should be required by NMFS and FWS. The letter enclosed in Appendix I from the US FWS mentions the fact that a Section 7 Consultation is required, but no response to this requirement is included in the Draft HSW-EIS. The method for conducting this process for NMFS is detailed in "Procedures for Conducting Consultation and Conference Activities Under section 7 of the Endangered Species Act (March, 1998)." Additionally the USFWS produced a document http://endangered.fws.gov/consultations/s7hndbk/s7hndbk.htm) that details their requirements for a Section 7 consultation. The listing of potentially affected species is only the first step in the consultation, if any threatened or endangered species are present and MAY be affected, then a formal consultation would be required. The evidence provided in the Draft HSW-EIS does not support a claim that there is not potential adverse affects to T&E species therefore a Formal Section 7 consultation should be required. Additionally there is no documentation of any efforts to contact the USFWS for a determination of state listed species of concern.
82	Specific	Health Impacts	*Page 2.22, Lines 16-19*, beginning with, "The concrete used . . ." Which certain radionuclides does this pertain to and can there be specific examples noted in other

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			parts of the Draft HSW-EIS? The following sentence goes on to state water affecting solubility of some waste elements. It would be nice to see these effects correlated in the risk assessment and know the outcomes of specific K_d coefficients for these "certain radionuclides."
83	General	Health Impacts	There are a variety of definitions used for cumulative risk across the USDOE complex. Ecology should use the definition as defined from EPA's (2002) Framework for Cumulative Risk Assessment. "Cumulative risk: The combined risks from aggregate exposures to multiple agents or stressors."
84	App F page 38 Line 27-28.	Health Impacts	Mercury can be present in the environment in many chemical forms (divalent, methylated, etc.) and with different transfer mechanisms. There needs to be an explanation on why the K_d value for lead is sufficient for mercury.
85	Section 4.8.2. Page 4.77 Appendix F, Section F.1.4.5, Page F.36	Health Impacts	Environmental Justice – This section briefly reviews some of the Executive Orders and census tract information associated with minority populations in the Hanford area. Relevant to this discussion would be citations that are associated with potential disproportionate risks assumed by minority populations, specifically Native American populations, because of cultural based behaviors. The Columbia River Inter-tribal Fish Commission (CRITFC) has numerous technical publications and surveys that should be recognized and used in the Draft HSW-EIS.
86	Appendix F, Section F.1.4, Page F.29 – F.36	Health Impacts	Two exposure scenarios are used by the Draft HSW-EIS for human health evaluations, the industrial scenario (F.1.4.1) and resident gardener scenario (F.1.4.2). Exposure parameters are provided in Tables F.35, F.36, F.37, and F.38. These two exposure scenarios are insufficient to account for the potential human exposure patterns that might occur. Neither of these exposure scenarios recognizes nor account for minority populations (Native Americans) that may be placed at a disproportionate risk. The Draft HSW-EIS dismisses the Model Toxics Control Act (MTCA, pp F.29) stating that the exposure parameters are not always used and by not attempting to identify relevant direct exposure patterns for children and to protect children. Major differences exist in the exposure parameters – note the 3 tables below that identify relevant risk information and direct exposure parameters for surface water, groundwater and soil in MTCA. Concurrent exposures, dermal + ingestion, are considered and evaluated in MTCA but are not considered or evaluated in this Draft HSW-EIS. Sauna or Sweat Lodge Air Inhalation. Imbedded within this exposure pathway is the implicit, not explicit, recognition of Native American cultural based habits (sweat lodge) that may account for environmental justice related concerns. As noted above, readily available documentation exists that more clearly documents cultural based behaviors with resulting exposure patterns that may place Native Americans at a disproportionate risk compared to the general population. This documentation should be recognized and used in the Draft HSW-EIS.
87		Health Impacts	Table of pollutant and ambient quality standard for short-term, workday and long-term exposures should be provided at the beginning of the discussion.
88	Sections 5-11 Appendix F	Health Impacts	Generally, it was difficult to follow the details of the health assessments, even for a person with training in radiological dose assessment. It was not always clear as to which exposure scenarios and assumptions were used for a given dose result. The information necessary to understand the details was often found scattered throughout the main document, the appendices, and outside documents. It was

			difficult to follow section 5.11 without having to frequently consult Appendix F or the HSRAM document. Section 5.11 should be more self-contained.
89	Sections 5-11 Appendix F	Health Impacts	What is the basis for choosing a point of assessment for groundwater at a distance of 1 km down gradient from the 200 West and 200 East Area LLBG? A distance of 1 km appears to be arbitrary. Why were groundwater concentrations not also estimated at the point of maximum impact, which is directly underneath the LLBG, or at the LLBG boundary?
90	Sections 5-11 Appendix F	Health Impacts	Clarify whether or not a RCRA cover was assumed for any given set of groundwater concentration results.
91	Sections 5-11 Appendix F	Health Impacts	Clarify the values that were used for the infiltration rate parameter. Values of 0.5 and 0.05 cm/y were cited throughout the document, however it is confusing as to which value was used for any given groundwater concentration result.
92	Section 5.3.3, pp 5.19-20, Tables 5.9 and 5.10	Health Impacts	Tables 5.9 and 5.10 would be enhanced if the Tc-99 and I-129 concentration values were given in addition to their percentage of Drinking Water Standard values. Otherwise, there is the possibility that the Tc-99 and I-129 values in the table may be confused with concentration values, instead of percentage of DWS.
93	Section 5.3.3, pp 5.19-20, Tables 5.9 and 5.10	Health Impacts	An additional table, similar to Table 5.9 and 5.10, should present groundwater concentrations at the LLBG boundary (see comment 1 above). As an example, Table 5.23, in section 5.11.1.3, presents health impacts to a resident gardener at the 1-km well (1 km down gradient from the 200 Area) from radionuclides in groundwater. The first point of confusion is that the resident gardener, as specified in Appendix F, is located 20.6 km from the 200 Area, but the table indicates that the assessment point is evaluated at 1 km from the LLBG. The second point of confusion is that the text does not make clear which exposure pathways are used in the dose calculations. The table caption leads one to think it is only groundwater pathways, but Appendix F indicates that other pathways, such as external radiation exposure from soil, are evaluated. If the table is indeed only for groundwater pathways, then where are the results for the other pathways discussed in Appendix F? For each dose result, it should be clear which exposure scenarios in Tables F.35 and F.37 are being used. The third point of confusion is that the reader must go back and forth between the main document, the appendices, and outside documents to find the details of the results given in the tables, and even then, it is still not clear as to which exposure scenarios are used, and as to what model parameter values are assumed. Each dose result should be clear as to what pathways and parameter values were used.
94	Section 5.11, p 5.42, Line 42	Health Impacts	What is the basis for choosing a distance of 100 m from the release point to assess the industrial scenario? The value of 100 m appears to be arbitrary.
95	Section 5.11, p 5.42, Line 43	Health Impacts	Specify the location of the resident gardener in the resident gardener scenario. The location of a worker in the industrial scenario is specified here, so the location of the resident gardener should also be specified here, even though it is specified in Appendix F. Appendix F specifies that the resident gardener resides 20.6 km ESE of the 200 Area. Specify a familiar landmark near this location, for example LIGO.
96	Section 5.11.1.2.1, pp 5.45-47, Tables 5.18 and 5.19	Health Impacts	Footnote (b) in the tables should specify that the LCFs are calculated as described in Appendix section F.1.7.
97	Section 5.11.1.2.1, p 5.45, Lines 17-18	Health Impacts	Rather than simply stating that the dose estimates are small, summarize the results from Tables 5.18 and 5.19 by comparing the maximum lifetime dose from those

			tables to any regulatory limits. For example, the maximum annual dose for the off-site MEI can be compared to the Washington State Air Emissions Regulations limit of 10 mrem/year.
988	Section 5.11.4.1.1, p 5.97, Table 5.58	Health Impacts	The text in section 5.11 and Appendix F states that the LCF estimates for the public are based on a conversion factor of 0.0005 LCFs per person-rem. The values for LCF in this table are not consistent with this value. For the 100 y and 500-y assessment time, the conversion factor appears to be 0.0004 - that for radiation workers, while for the 300 y assessment time, the factor appears to be 0.0007.
99	Section 5.11.4.1.2, p 5.97, Line 11	Health Impacts	Clarify what is meant by the dose being accumulated over a 50 year time period. Is this the 50-year period assumed for committed dose from inhalation and ingestion, or is it the lifetime exposure duration? If the latter, this is inconsistent with an assumed exposure duration period of 30 years used elsewhere in the health impact section.
100	Page. S.18, Sect. S.8.3, Paragraph 1	Health Impacts	Health effects appear to be limited to potential uptake of drinking water by citizens obtaining water from the Columbia River. One of the Hanford Site's remedial objectives is to restore groundwater to its "maximal beneficial use"; i.e., to make it potable. This analysis should also address impacts on groundwater within the Hanford Site before it discharges to the Columbia River.
101	Page. S.18, Lines 43 – 46	Health Impacts	Where is the analysis that supports the conclusion that 28 latent cancer fatalities could result from consequences arising from the occurrence of a design basis earthquake?
102	Table S.1, Page S.11	Groundwater	The disposal alternatives identified for Low-Level and Mixed Low Level Waste Alternatives 1 and 2 and No Action do not indicate that groundwater monitoring will occur for the low-level waste trenches via RCRA groundwater monitoring networks designed to detect releases from the LLBG TSD and solid waste management units. The *Hanford Site Solid Waste Management Environmental Impact Statement Technical Information Document* (HNF-4755) appears to have omitted analysis associated with the construction/installation of groundwater monitoring wells, as well as monitoring costs. Considering the significant deficiencies associated with the existing RCRA groundwater monitoring networks as well as the size of the LLBG, the capital expenditure associated with installation and operation of a groundwater monitoring network capable of detecting releases from the low-level waste trenches could be significant. The networks will be designed (with installation of additional wells) via the RCRA final status permit issuance process. Groundwater monitoring will occur during operations of the LLBG units. Therefore, the Low-Level Waste Alternatives 1 and 2 should include indications that additional groundwater monitoring wells will be installed and groundwater monitoring will be performed throughout operations of the LLBG. The lack of analysis to consider installation of additional groundwater monitoring wells and groundwater monitoring renders the Draft HSW-EIS analysis incomplete and non-bounding. (§ 1502.14, 1502.15, and 1502.16)
103	Section S.8.4 Page S.20	Groundwater	The section's total numbers/ranges omit added potential (and estimated) costs associated with groundwater monitoring, *which could be significant, based on the deficiencies of the system*..
104	Section S.8.5 Page S.20	Ground-water	The statement that "impacts for all resources considered in the Draft HSW-EIS are relatively small . . ." in relation to groundwater is included without a technical basis. For purposes of inclusion of a bounding RCRA groundwater monitoring needs

			analysis, Ecology's analysis indicates that a significant number of additional RCRA groundwater monitoring wells could be required for the LLBG groundwater monitoring networks to be compliant (i.e., for the groundwater monitoring system to consist of a sufficient number of wells, installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that . . ."represent the quality of groundwater passing the point of compliance"). Therefore, either the statement must be deleted or a disclosure must be inserted. If a disclosure is inserted, it must identify that the RCRA groundwater monitoring networks associated with the LLBG are significantly deficient. It must also be disclosed that the RCRA groundwater monitoring networks are so deficient that no technically based conclusion of current or future impact in relation to groundwater can be made for the units at this time. (§ 1502.7, 1502.14, 1502.15, and 1502.16)
105	Section 3.0 General Comment	Groundwater	Section 3.0. The section does not appear to include groundwater monitoring in any of the alternatives. Similarly, the section does not appear to include cost evaluations for groundwater monitoring well installation needs. It is recommended that a description of LLBG RCRA groundwater monitoring requirements be included in Sections 3.1, 3.2, and 3.3 and that cost estimates for these actions be included in Section 3.7 and in Table 3.6. It should be noted that groundwater monitoring requirements are applicable to all alternatives. Considering the logic applied to the No Action alternative whereby "currently defined LLBG" are analyzed to manage waste, then the No Action alternative should also include groundwater monitoring costs. (§ 1502.23)
106	Section 3.7 And Table 3.6	Groundwater	The section does not include groundwater monitoring in the comparison of costs of alternatives. Washington Administrative Code (WAC) 173-303-645 requires groundwater monitoring at RCRA land-based TSDs. WAC 173-303-645 requires groundwater monitoring at the point of compliance for detection of contaminants. Furthermore, the same regulation requires "the groundwater monitoring system must consist of a sufficient number of wells, installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that . . .represent the quality of groundwater passing the point of compliance." It is recommended that costs be estimated for data evaluation (including statistical analysis between up-gradient and down-gradient wells) and reporting over a 74 year groundwater monitoring period. (§1502.14, 1502.15, 1502.16 and 1502.23)
107	p. A.14	Groundwater	The response to comments concerning groundwater does not appear to address the commenters' issue of the adequacy of data about existing vadose zone contamination. Please explain how the SAC and related activities provide adequate data.
108	Table S.3, Page S.19	Groundwater	The Draft HSW-EIS groundwater quality impact analysis assumed an infiltration rate modeling input parameter that is an order of magnitude less conservative than the same infiltration rate modeling input parameter used to support USDOE's LLBG disposal authorization basis. The use of the less conservative modeling input parameter is not supported by a technical basis as no such technical basis exists. Of regulatory concern to Ecology, the Draft HSW-EIS groundwater quality impact

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			analysis selects "points of assessment" to describe groundwater quality impacts. None of the "points of assessment" selected meet RCRA regulatory requirements for monitoring groundwater quality at the LLBG "point of compliance." While RCRA defines the groundwater point of compliance to be at the unit boundary, the Draft HSW-EIS's nearest "point of assessment" is located 1 km away from the LLBG unit boundaries. The affect of selecting such a "point of assessment" away from the LLBG unit boundaries is to greatly reduce groundwater quality impacts. This methodology is inconsistent with RCRA regulatory requirements and could be considered to be misleading (i.e., the approach masks and/or reduces groundwater quality impacts). Detailed comments regarding the above issues are attached. In summary, the Draft HSW-EIS groundwater quality impact analysis is deficient and is neither conservative nor consistent.
109	Section S.8, Page S.17, Lines 43-44	Groundwater	The analysis provided in the Draft HSW-EIS is neither conservative nor consistent with similar analyses performed to support the USDOE's LLBG disposal authorization basis. Furthermore, the basis for the Draft HSW-EIS groundwater evaluations of groundwater quality is inadequate and does not support an assumption of no current impact from the LLBG.
110	Section 1.5.1.3, Page 1.16	Groundwater	The Draft HSW-EIS does not adequately and/or accurately reflect groundwater and/or corrective action regulatory requirements applicable to an evaluation of reasonable alternatives or mitigation measures. Deficiencies in the current groundwater monitoring networks should be addressed, including an estimation of the number and cost of needed wells, or acceptable alternative monitoring where wells cannot be constructed because of a declining water table. Without this information, the cost analysis is incomplete.
111		Groundwater	Ecology has concluded that the Draft HSW-EIS groundwater quality impact analysis does not provide an evaluation of reasonable alternatives or mitigation measures to reduce or minimize adverse impacts to groundwater. This conclusion is primarily based on the following: 1) the insufficiency of existing groundwater quality information, 2) a lack of groundwater impact modeling conservatism (in light of the lack of LLBG-specific data), 3) an inadequate consideration of applicable regulatory requirements, and 4) inconsistencies associated with the groundwater impact analysis methodology. Ecology has concluded that the groundwater quality impact analysis provides neither the basis for the alternatives evaluated nor the basis for the omission of mitigation measures.
112	Section S.6.1, Page S.10 Section S.6.2, Page S.12	Groundwater	The section is silent on RCRA groundwater monitoring requirements. The section should identify that RCRA groundwater monitoring requirements will be imposed via the RCRA final status permit. In addition, it should be identified that groundwater monitoring provisions will address the entire LLBG unit boundaries (as defined by RCRA Part A permit). (§ 1502.14, 1502.15, and 1502.16)
113	Table S.1, Page S.11	Groundwater	The disposal alternatives identified for Low-Level and Mixed Low Level Waste Alternatives 1 and 2 and No Action do not indicate that groundwater monitoring will occur for the low-level waste trenches via RCRA groundwater monitoring networks designed to detect releases from the LLBG TSD and solid waste management units. The *Hanford Site Solid Waste Management Environmental Impact Statement Technical Information Document* (HNF-4755) appears to have omitted analysis

			associated with the construction/installation of groundwater monitoring wells as well as monitoring costs. Considering the significant deficiencies associated with the existing RCRA groundwater monitoring networks as well as the size of the LLBG, the capital expenditure associated with installation and operation of a groundwater monitoring network capable of detecting releases from the low-level waste trenches could be significant. The networks will be designed (with installation of additional wells) via the RCRA final status permit issuance process. Groundwater monitoring will occur during operations of the LLBG units. Therefore, the Low-Level Waste Alternatives 1 and 2 should include indications that additional groundwater monitoring wells will be installed and groundwater monitoring will be performed throughout operations of the LLBG. The lack of analysis to consider installation of additional groundwater monitoring wells and groundwater monitoring renders the EIS analysis incomplete and non-bounding. (§ 1502.14, 1502.15, and 1502.16)
114	Appendix G; Page. G.4, Line 27	Groundwater	What is "an appropriate release model?"
115	Chapter 4; Page. 4.38, Paragraph 1	Groundwater	Old, abandoned and/or poorly sealed vadose zone and groundwater wells are also potential preferential pathways and should be mentioned here.
116	Chapter 4; Page. 4.36, Sect. 4.5.1.4, Paragraph 1	Groundwater	Assuming that groundwater recharges West Lake and that groundwater is or has flowed from the 200 East Area toward West Lake, the salts deposited from evaporation could potentially contain some Hanford contaminants. Runoff could also carry contaminated material to West Lake. This possibility should at least be mentioned.
117	Chapter 4; Page. 4.42, Fig. 4.16	Groundwater	Water table contours north and east of the Columbia River indicate significant differences in the elevation of the water table. However, north and east of the Columbia, there are no well locations shown, so it is difficult to determine how these elevations were obtained. What is the source of these elevation/head data?
118	Chapter 4 Page. 4.43, Fig. 4.17	Groundwater	Two meter contours do not convey a clear picture of water table elevation. Supplemental contour lines at 0.5m intervals should be added to this map.
119	Chapter 4; Page. 4.47, Table 4.9	Groundwater	Is the value for Cr for total Cr, hexavalent Cr? Please clarify.
120	Chapter 4; Page. 4.49, Sect. 4.5.3.3, Paragraph 1, Lines 36 – 39	Groundwater	The communication between the unconfined and confined aquifers is grossly understated. With the Elephant Mountain member of Columbia River basalt absent in at least two boreholes north of the 200 East Area, the unconfined and confined aquifers (Rattlesnake Ridge member) are in direct contact in a window of unspecified dimensions. Correct this understatement.
121	Chapter 4; Page. 4.50, Paragraph 3	Groundwater	Artificial recharge to the unconfined aquifer continues in the form of discharge of sanitary waste liquids and water from leaking raw water distribution lines. These sources should be added.
122	Chapter 4; Page. 4.50, Paragraph 4	Groundwater	A supporting basis needs to be added for the following statement, ". . . no indication is shown of aquifer interconnection." How do the piezometric heads in the unconfined and confined aquifer systems compare across the site? It also needs to be made clear whether reference to deeper aquifers is to the basalt confined aquifer system or to the semi-confined aquifers beneath the Ringold Lower Mud.
123	Appendix G; Page. G.6, Line 25	Groundwater	The statement is made that there are more than 100 radioactive and non-radioactive constituents that could potential impact groundwater. Thereafter, the entire analysis is based on various categories of radionuclides which may simulate the behavior of

			non-rad constituents in flow and transport, but which present different hazards to humans if they get to groundwater and are consumed. Only Pb and Hg are evaluated (pg. G.9) and dismissed. Justify these exclusions.
124	Appendix G Page. G.21, Lines 14 – 16, 19 – 20	Groundwater	Earlier, the statement was made that a one dimensional model was used because of insufficient characterization. Yet, here you state that one-dimensional models are inadequate to represent preferential pathways (unsealed boreholes, clastic dikes) and indicate that they are too small and discontinuous to be of any real significance as a preferential pathway. Without adequate characterization data, how can you make this assumption?
125	Appendix G; Page. G.24, Fig. G-2 and Lines 12 – 13	Groundwater	If this is purported to be a conservative analysis, justify the decision to determine a release date when 50% of unit mass has reached groundwater. This is even less conservative given that releases are assumed to begin in 2046.
126	Appendix G; Page. G.33	Groundwater	Has any consideration been given to showing the cumulative releases to the Columbia River from all isotopes/constituents for different projected dates (e.g., 1,000, 5,000, 10,000 yrs.)?
127	Table 5.1, Page 5.4	Conclusions Not Supported	Land use commitments are listed on Table 5.1. In an effort to confirm bounding scenarios, the referenced *Technical Information Document* (FH 2002) was reviewed for a cursory accuracy check. To explain, on page 5.3, lines 9-11, it is indicated that "except where otherwise specified, all construction and operations engineering data that form the basis for environmental impact analysis of the alternatives are provided in the *Technical Information Document* prepared by Fluor Hanford (FH 2002)." When the land use commitments of Table 5.1 for "218-W-5 Exp" were checked in the referenced document, it was found that there are no impact analysis numbers included for this "contingency expansion" (see Appendix D, pages D-13 and D-14, Section D5.1 of *Technical Information Document* [FH 2002]). It should be noted that the "contingency expansion" of 202 hectares represents just less than half of the LLBG sub-total (425 hectares). The omission and the lack of an accompanying explanation are significant. Considering the zeros listed for upper and lower bounds, it is concluded that no impact analysis has been done for this 202 hectare "contingency expansion." If such an expansion were deemed necessary in the future, an additional NEPA review would be appropriate. Currently, such an omission renders the analysis incomplete and non-bounding. In addition, such an omission reduces confidence of the analysis referenced as being complete without an explanation for omission of numbers. Therefore, either remove the "218-W-5 Exp" from the scope of the Draft HSW-EIS or include the supporting bounding analysis. (§1502.7, 1502.14, 1502.15, 1502.16 and 1502.23)
128	Table 5.1, Page 5.4	Conclusions Not Supported	The land use commitment for 218-W-6 is identified as zero in several alternatives. No lettered note is indicated for the burial ground. The zeros could mean that this unit is currently unoccupied and that there is no intention of using the burial ground. Or, the zeros could mean that this unit is currently unoccupied and that there will be no disposal in the future, merely interim storage. Or, the zeros could mean that this unit is currently unoccupied and that the Draft HSW-EIS impact analysis was omitted. In an attempt to understand what the zeros mean, the referenced *Technical Information Document* (FH 2002) was reviewed. On pages D-13 through D-17, it is indicated on Tables D5-2 through D5-D10 that the total area of the burial ground is 16 but that the area to be capped under all scenarios is zero. From a third document

			(*Performance Assessment Monitoring Plan for the Hanford Site Low-Level Burial Grounds* [DOE/RL-2000-72, Rev. 0]) it is indicated that the 218-W-6 burial ground has not yet received any waste and is reserved for future mixed waste disposal. If the 218-W-6 burial ground is to be used for mixed waste, all alternatives should analyze land use commitments for the unit (16 hectares). In summary, from Section 5.1, there is inadequate explanation or even reference to a document where it may be understood for the reader/decision-maker to understand what the land use numbers mean under the various scenarios and alternatives. (§1502.7, 1502.14, 1502.15, 1502.16 and 1502.23)
129	Page E.1, Line 25	Conclusions Not Supported	The reference 4.2.3 could not be found
130	Page E.3, Line 17	Conclusions Not Supported	All modeling assumptions should be listed.
131	2.1.3.1, Page 2.9	Conclusions Not Supported	USDOE states that, for the post-1970 TRU waste, "observations and monitoring of the area around the drums within the trenches has not detected the release of any alpha emitters, such as plutonium." It is Ecology's position that the current monitoring system is inadequate for detecting releases into the soil and/or groundwater from these trenches. USDOE does not state if the monitoring that was done detected releases from sources other than alpha emitters. (Supporting data)
132	Sec. S.3, pp. S.2-S.3	Conclusions Not Supported	The scope of this Draft HSW-EIS was narrowed, based on the issuance of the Record of Decision under the WM-PEIS. However, the WM-PEIS did not provide adequate information for decision-makers to select among specific sites, based on a comparison of site-specific impacts. In response to numerous comments about the inadequacy of site-specific environmental information in the Draft WM-PEIS, USDOE repeatedly referred commenters to the "Technical Report on Affected Environments." That document is apparently not available to reviewers of the Draft HSW-EIS, meaning that USDOE has still not provided the public an adequate basis for assessing impacts of treatment or disposal at alternate sites.
133		Conclusions Not Supported	The Draft HSW-EIS is a very complex document. Numbered sections in Volume 1 refer the reader for details to the lettered sections in Volume II. However, in Volume II, the equations, their derivations, and a range of values are not consistently presented for the reader to use in an independent verification of the calculations. For example, the equations used by RADTRAN 4 (Appendix H) are missing, but the basic air emission equation is shown in Appendix E (Equation E.1 on page E.9).
134	Chapter 5; Page. 5.12, Sect. 5.3.1, Lines 33 – 36	Conclusions Not Supported	Provide a basis for this expectation.
135	Chapter 5; Page. 5.12, Sect. 5.3.1, Lines 37 – 42	Conclusions Not Supported	Provide a basis for this expectation. Specify where in the vadose zone (i.e., how deep in relation to the water table and/or below trench bottoms) LLBG contaminants have infiltrated and at what rate are they infiltrating toward groundwater.
136	Chapter 5; Page. 5.13, Lines 9, 10	Conclusions Not Supported	Provide a basis for this expectation.
137	Chapter 5; Page. 5.14, Lines 10, 11	Conclusions Not Supported	Until such time as retrievably stored TRU wastes are retrieved, processed and shipped off-site, they are part of the vadose zone inventory attributable to the LLBG and should be included. Previous Hanford plans have gone awry (e.g., Grout), so until these TRU wastes are removed, or there is a firm schedule commitment and

			budget to accomplish the removal, they should be included as part of the inventory.
138	Chapter 5; Page. 5.16, Lines 16 – 34	Conclusions Not Supported	Recent investigations at SST WMA S-SX indicate that sorption (i.e., distribution) coefficients may be variable because of waste and soil characteristics. Is it appropriate to use single values for all these contaminants throughout the entire vadose zone? Cobalt is indicated as belonging to Group 5; i.e., strongly sorbing. However, Co-60 will complex with organics and other constituents and become much more mobile. Are there any co-contaminants present in the waste or soil that would result in changed mobility for any other of the Group 5 constituents?
139	Chapter 5; Page. 5.12, Sect. 5.3, Lines 16, 17	Conclusions Not Supported	Provide a basis for the statement, "None of these contaminants are thought to have originated from the LLBG."
140	Chapter 5; Page. 5.12, Sect. 5.3, Lines 19 – 23	Conclusions Not Supported	How many of the listed contaminants were discharged in any form to any of the LLBG?
141	Section S.8	Editorial	General statements and assertions are made here. As this is a summary, the appropriate part of the document that addresses these specific issues (e.g., Land Use, Human Health) should be cited to allow the reader to verify that the supporting analyses provide the analytical basis for the assertions made in this section.
142	Page S.19, Table S.3	Editorial	Reference (here) should be made to the source and/or analyses that support the various quantities and conclusions listed in this table under various categories.
143	Page. S.18, Line 10	Editorial	Define and locate the "200 Area Industrial-Exclusive zone," preferably on a map.
144	Chapter 4; Page. 4.25, Figure 4.9	Editorial	This is taken from a BWIP document and shows a location labeled "Candidate Site." This is most likely the Reference Repository Location (RRL), the candidate for a basalt high-level nuclear waste repository at Hanford. This location is irrelevant to this Draft HSW-EIS and should be removed.
145	Chapter 4; Page. 4.31, Line 9	Editorial	Delete the word "all." These are the known earthquakes, but others may have occurred, so the map is likely incomplete.
146	Chapter 4; Page. 4.32, Line 10	Editorial	Insert word "known" between "all" and "earthquakes." Same reason as previous comment.
147	Chapter 4 Page. 4.45, Lines 1 through 5	Editorial	These two sentences are not clear. Rewrite for clarity. The USDOE's DCG is somewhat self-serving and not nearly as protective of human health and the environment as the DWS/MCL.
158	Chapter 5; Page. 5.16, Lines 36, 37		Provide a justification as to why analyses of chemical constituents were not performed.
149	Section 6.3, Page 6.2, Lines 23-25	Editorial	The paragraph includes several statements that are out of date. Update and clarify the description of the Hanford Site RCRA permit. Recommended wording for the sentence in lines 26-27 is: "The Hanford Site's RCRA permit was originally issued in two portions, one portion was issued by EPA Region X and the other portion was issued by Ecology." Similarly, recommended wording for the sentence in lines 27-28 is: "The EPA-issued portion of the RCRA permit covered the Hazardous and Solid Waste Amendments portion of the RCRA permit for the U.S. Ecology Site located on the Hanford Site (EPA 1994)." Similarly, recommended wording for the sentence in lines 28-30 is: "The second portion of the Hanford Site RCRA permit covered the dangerous waste provisions and was issued by Ecology (Ecology 1994)." Similarly, recommended wording for the sentence in lines 29-30 is: "The Hanford Site RCRA

			permit was recently modified for Ecology to cover Hazardous and Solid Waste Amendments (i.e. via Ecology's RCRA Corrective Action authorization) previously not included in the permit." Similarly, recommended wording for the sentence in lines 30-33 is: "The Ecology portion of the RCRA permit includes standard conditions, general facility conditions, and specific conditions for individual operating treatment, TSD units and SWMUs undergoing corrective action, and TSD units undergoing closure. (§1502.7)
150	Sec. 3.7, p. 3.15		Please explain how the costs reflected in Table 3.6 are consistent with those presented in USDOE's Report to Congress on the Cost of Waste Disposal (July 2002). Note the following statement on p. A-39 of the latter report: "Hanford does not have cost estimates for long-term stewardship."
151	Appendix G; Page. G.4, Line 28		Use of a 1-D model for vadose zone transport is rather simplistic. Justify this choice.
152	Page. S.18, Sect. S.8.3, Paragraph 1		Health effects appear to be limited to potential uptake of drinking water by citizens obtaining water from the Columbia River. One of the Hanford Site's remedial objectives is to restore groundwater to its "maximal beneficial use"; i.e., to make it potable. This analysis should also address impacts on groundwater within the Hanford Site before it discharges to the Columbia River.
153	Page. S.18, Lines 43 – 46		Where is the analysis that supports the conclusion that 28 latent cancer fatalities could result from consequences arising from the occurrence of a design basis earthquake?
154	Chapter 4; Page. 4.42, Fig. 4.16		Water table contours north and east of the Columbia River indicate significant differences in the elevation of the water table. However, north and east of the Columbia, there are no well locations shown, so it is difficult to determine how these elevations were obtained. What is the source of these elevation/head data?

Draft Hanford Site Solid Waste Program
Environmental Impact Statement (DOE/EIS-0286D)
August 21, 2002

General Comments
Washington State Department of Ecology

Summary of the Draft HSW-EIS

The Draft HSW-EIS addresses the management of low-level waste (LLW), mixed low-level waste (MLLW), and post-1970 transuranic (TRU) waste at the Hanford Site. Management of these wastes would involve treatment, storage, and disposal. Treatment, if it occurs, would be at either the Hanford Site, or an off-site commercial facility. Storage would occur at the Hanford Site, and disposal would occur at the Hanford Site for LLW and MLLW, and at the Waste Isolation Pilot Plant (WIPP) for post-1970 TRU.

Three alternatives, for each waste type, are evaluated in the HSW-EIS.

The first alternative, the preferred alternative, generally consists of utilizing existing facilities for storage, commercially treating and/or modifying existing facilities for waste treatment, and filling existing trenches and constructing deeper, wider, trenches and capping them at closure. Post-1970 TRU would be sent to WIPP for disposal.

The second alternative proposes using current capabilities for storage and constructing new treatment facilities. Waste would be disposed in existing trenches and new trenches would be constructed using the current design. All trenches would be capped and closed. Post-1970 TRU would be sent to WIPP for disposal.

The third alternative, the no action alternative, would utilize existing treatment and storage capabilities. No new trenches would be constructed. Once the existing trenches are filled the remaining waste would be placed into indefinite storage. Existing storage facilities would be expanded to manage increased volumes of waste. Commercial facilities would be utilized on a limited basis. MLLW trenches would be capped at closure. Most post-TRU would be sent to WIPP, however, some would remain untreated.

Each alternative was evaluated for a range of waste volumes:

- LLW ranges from 432,582m^3 to 631,427m^3 and includes LLW generated at the Hanford Site and waste imported from other United States Department of Energy (USDOE) Facilities.
- This also includes 283,067m^3 of waste which is already disposed in the Low Level Burial Grounds (LLBG) and
- MLLW ranges from 65,334m^3 to 205,678m^3, which includes waste that is generated at the Hanford Site and imported from other USDOE and commercial facilities.
- Only one volume is used for post-1970 TRU Waste: 45,806m^3, the maximum Hanford Site forecast.

The Draft HSW-EIS assumes implementation of the February 25, 2000, Record of Decision (ROD) for MLLW and LLW from the Waste Management Programmatic Environmental Impact Statement (WM-PEIS) (DOE/EIS-0200, May, 1997). That ROD determined that Hanford would continue to dispose of LLW and MLLW generated on-site. The ROD also identified Hanford and the Nevada Test Site as "regional" disposal facilities for LLW and MLLW from other USDOE sites.

Issues Concerning Scope and Analysis

155 The Draft HSW-EIS essentially evaluates a limited range of near-term alternative means to install treatment capability and to dig waste disposal trenches. It evaluates the effects of doing so for a limited range of waste volumes.

156
- The Draft HSW-EIS assumes that the WM PEIS adequately compared the impacts of treatment and disposal facilities at various sites, but it did not. At a minimum, the WM PEIS did not have available even the limited information contained in the Draft HSW-EIS. The information used to compare Hanford to other disposal sites in the WM PEIS was never widely available for public review and is not available for comparison with the Draft HSW-EIS.

157
- The Draft HSW-EIS evaluates only the management of wastes owned by, or coming to, the existing Waste Management Program, touching only lightly on previously buried wastes, environmental restoration wastes, naval reactors, and other wastes disposed near surface at Hanford.

158
- The Draft HSW-EIS does not evaluate other options currently under active discussion, such as the lined mega-trench or expanded use of the Environmental Restoration Disposal Facility (ERDF).

159
- The Draft HSW-EIS does not fully evaluate the potential for additional required management of pre-1970 TRU wastes, or corrective action for releases of chemically hazardous wastes from burial grounds filled before 1988.

160
- The Draft HSW-EIS does not evaluate treatment and storage of significant quantities of TRU waste from other sites.

161
- The Draft HSW-EIS does not evaluate the impact of permanent disposal of incidental low activity tank wastes in shallow land burial as proposed in the Supplemental Tank Waste Remediation System EIS.

162 According to NEPA requirements, 40 CFR Part 1500.2(e) the NEPA process should be used to identify and assess reasonable alternatives for the proposed action "that will avoid or minimize adverse effects of these actions." The state of Washington requests that the range of alternatives analyzed be broadened to include "no import of out of state waste" and the "worst case" import scenario based on the WM-PEIS. In addition,

163 40 CFR Part 1506.2(d) requires Federal agencies to integrate environmental impact statements with the State and local planning process. When there are "inconsistencies of a proposed action with any approved State or local plan and laws (whether or not federally sanctioned)" it should be discussed in the EIS.

164 The Draft HSW-EIS does not acknowledge or discuss the state of Washington's policies about accepting out of state waste, nor hashave any reconciliation or mitigationmitigative measures been presented.

165 The Draft HSW-EIS states that the environmental analysis in the document was conducted through the year 2046, which represents the end of most waste management operations at the site. This resulted in the following scope and bounding concerns:

- The post-closure requirements for waste disposal facilities may extend beyond the end of active waste management, which is not indicated by the 2046 date.
- 166 Long term impacts to groundwater and the Columbia River were evaluated for 10,000 years. There is no examination of impacts in the intervening period nor any indication of the extent to which the 10,000 year results are a function of radionuclide decay.

Conclusions Not Supported

167 The Draft HSW-EIS reaches conclusions without adequate data and analysis. It often fails to disclose what information is *not* known in arriving at conclusions.

- 168 The Draft HSW-EIS does not include sufficient data about either characteristics of disposed waste, or groundwater movement at Hanford.
- 169 The Draft HSW-EIS does not include data about impacts to certain ecological receptors, or about potential harm to restoration of priority habitat that may have been degraded by fire or pesticides.
- 170 The impact assessments underlying the Draft HSW-EIS are not accompanied by uncertainty analyses that would provide some indication of the reliability of estimates and predictions.
- 171 The treatment of cumulative impacts from the proposed treatment and disposal activities, in conjunction with other reasonably foreseeable actions at Hanford, is extremely limited and not credible based on the material presented.

172 According to the requirements of Title 40 of the Code of Federal Regulations (CFR) Part 1502.22 the foreseeable significant adverse effect on the human environment should be evaluated. Reasonably foreseeable impacts include "catastrophic consequences, even if their probability of occurrence is low." Based on the USDOEs continued difficulties implementing and maintaining thorough waste characterization, groundwater monitoring at waste disposal sites, and corrective actions, it would not be unreasonable to consider groundwater contamination reaching the Columbia River. Therefore, this environmental impact should be considered. If information is incomplete or unavailable the Draft HSW-EIS is supposed to acknowledge the lack of information. Mitigative measures should be proposed and described as appropriate.

Inadequacies of the Regulatory Analysis

Based on 10 CFR Part 1021.103, in which the USDOE adopts the regulations for implementation of the National Environmental Policy Act (NEPA), 40 CFR Parts 1500

173 through 1508, the Washington State Department of Ecology has identified several regulatory inadequacies/omissions in the Draft HSW-EIS. The Draft HSW-EIS does not adequately consider the current regulatory challenges already facing Hanford with regard to dangerous and mixed waste management. The Hanford Federal Facility Agreement and Consent Order (HFFACO) is a compliance agreement for bringing USDOE into conformity with the Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Restoration, Compensation and Liability Act (CERCLA), and the Hazardous Waste Management Act (HWMA) requirements for the waste at Hanford. In addition, the Hanford RCRA Permit details requirements for managing dangerous and mixed waste in accordance with state and federal regulations, including corrective action at solid waste management units, and integration of RCRA and CERCLA activities. USDOE continues to struggle to achieve and maintain overall compliance with mixed waste management at Hanford, particularly with regard to characterization, storage, and treatment of mixed waste. Prior to accepting more waste from across the nation, the state of Washington must be assured that current waste management activities at Hanford are protective of human health and the environment and compliant with state and federal regulations, and the Tri-Party Agreement (TPA).

174 Throughout the Draft HSW-EIS the text is incomplete or silent on RCRA regulatory authorities for waste management facilities, in particular with regard to the LLBG, but also to other facilities such as T-Plant, CWC, WRAP, LERF, ETF, etc. Waste management, permitting, closure, and post-closure requirements for RCRA treatment, storage, and disposal (TSDs) and waste management units are not identified. Corrective action authority to address releases from regulated facilities is unclear. Extensive revision of a number of sections within the document is needed to accurately reflect the regulatory environment. Without clarity on RCRA applicability and extent, bounding conditions can not be properly established and thus alternatives can not be adequately evaluated. Here are specific examples of such omissions:

- The Draft HSW-EIS does not adequately address the limitations imposed by the present Part A designation for the LLBG, and by the requirements that will accompany inclusion of Hanford LLBG in the Hanford Sitewide Permit.
- The Draft HSW-EIS does not adequately address the regulatory requirements for modification of the Part B permits for the Central Waste Complex (CWC), 200 Area Effluent Treatment Facility (ETF), Liquid Effluent Retention Facility (LERF), LLBG, T Plant Complex (T Plant), and the Waste Receiving and Processing (WRAP) Facility.
- The Draft HSW-EIS does not adequately address the regulatory requirements associated with mixed waste and mixed transuranic waste storage and treatment at CWC, WRAP and T Plant.
- The Draft HSW-EIS does not address the treatment requirements associated with mixed waste under Washington law. (**RCW 70.105.050**)
- The Draft HSW-EIS reflects insufficient attention to consultation requirements under the Endangered Species Act.
- The Draft HSW-EIS does not recognize and adhere to the state of Washington's water antidegradation policies (**WAC 173-201A-070**) and the state of Washington's maintenance and protected waters designated as outstanding resource waters (**WAC 173-201A-080**).

- The Draft HSW-EIS does not adequately and/or accurately reflect corrective action regulatory requirements applicable to an evaluation of reasonable alternatives or mitigation measures.

175 Several regulatory requirements specified in 40 CFR Part 1502 have not been adequately addressed. The purpose and need statement does not adequately specify the underlying purpose and need for the proposed action. The alternatives should include a rigorous exploration and evaluation of "all reasonable alternatives' or an explanation of why they were eliminated. Alternatives not within the jurisdiction of the lead Agency should also be included. The Draft HSW-EIS does not include an adequate description of the affected environment, or the environmental impact. The impacts to the long-term productivity and the irreversible commitment of resources have not been presented to decision makers. The indirect effects of the alternatives and their significance to the Columbia Basin environment have been overlooked. In addition, conflicts between the proposed actions and the objectives of State and local government have not been addressed. The Draft HSW-EIS does not meet the requirements of 40 CFR Part 1508.25(2), addressing the cumulative actions of the recently-approved Hanford Site Accelerated Cleanup with the proposed alternatives, which when viewed together have cumulatively significant impacts and should therefore be discussed in the same impact statement.

Groundwater Impacts and Range of Alternatives to Protect Groundwater

176 The groundwater quality impact analysis (Appendix G of the Draft HSW-EIS) represents the basis for evaluating reasonable alternatives or mitigation measures. The LLBG groundwater quality impact analysis methodology is deficient in several significant ways:

1) the omission of analysis of impacts occurring during operation of the LLBG;
2) releases are not assumed to begin until 2046;
3) the source term and enabling assumptions are incomplete and lacking in sufficient basis;
4) the Point of Compliance for a RCRA TSD facility is the waste site boundary, NOT an arbitrarily chosen point(s);
5) characterization data is inadequate, and
6) assumptions of no release to groundwater from LLBG are based on inadequate data.

177 Deficiencies in the current groundwater monitoring networks to accommodate changes in groundwater flow direction, dropping groundwater levels, and "dry" monitoring well, should be addressed, including an estimation of the number and cost of needed wells, or acceptable alternative monitoring. Without this information, the cost analysis contained in the Draft HSW-EIS is also incomplete. These omissions render the impact and cost evaluations 1) non-bounding and incomplete, and 2) do not allow the reader to understand that the groundwater quality impact analysis is not supported by adequate LLBG-specific data.

Ecological Assessment/Impacts

The purpose of Appendix I is to give additional justification to statements made in the sections on ecological impacts found in volume one. Drawing upon various studies, Appendix I identifies most of the ecological systems at risk, but conspicuously omits several species and guilds such as the microbiotic crust, water foul, and bald eagles that are identified in the *Biodiversity Inventory and Analysis of the Hanford Site* (The Nature Conservancy, 2000).

178

Not only does this assessment fail to identify all potentially impacted species, it fails to adequately address potential impacts to species and habitats identified. Risk from chemical contaminants, such as carbon tetrachloride and PCB, associated with MLLW and TRU waste processing respectively, are not evaluated. The impact of increased land use on flora and fauna is dismissed, citing effects of fire and herbicide use. All impacts that prevent recovery of a "priority habitat" must be assessed in addition to effects on currently present habitats and species. There is no quantification or qualification of uncertainties associated with the assessment of potential ecological impact on the site actions. An uncertainties analysis needs to be part of the assessment.

179

There are conspicuous data gaps that prevent a proper assessment of the potential impacts of the proposed actions on species and habitats. This document does not provide sufficient information on protection of state and federally listed species. Therefore, it is Ecology's opinion that a formal Endangered Species Act Section 7 consultation would be required to ensure protection of Threatened and Endangered Species.

180

The Draft HSW-EIS tends to ignore a number of ecological assessment/impact issues.

- The Draft HSW-EIS does not provide sufficient information to allow competent decisions to be made.
- The Draft HSW-EIS does not provide a comprehensive list of impacted species and habitats.
- The Draft HSW-EIS does not assess the risk from chemical contaminants.
- The Draft HSW-EIS does not quantify the impacts of proposed actions on all present and future potential habitats.

Health Impacts

181

It was difficult to follow the details of the health assessments, even for a person with training in radiological dose assessment. It was not always clear as to which exposure scenarios and assumptions were used for a given dose result. The information necessary to understand the details was often found scattered throughout the main document, the appendices, and outside documents. In accordance with 40 CFR 1502.21 material should be incorporated into the EIS by reference, to reduce bulk, but "without impeding agency and public review of the action." The content of the cited material should be briefly described in enough detail to allow for adequate review of the document and proposed alternatives.

As an example, Table 5.23, in section 5.11.1.3, presents health impacts to a resident gardener at the one (1) kilometer well (one [1] kilometer down gradient from the 200 Area) from radionuclides in groundwater. The first point of confusion is that the resident gardener, as specified in Appendix F, is located 20.6 kilometers from the 200 Area, but the table indicates that the assessment point is evaluated at one (1) kilometer from the LLBG. The second point of confusion is that the text does not make clear which exposure pathways are used in the dose calculations. The table caption leads one to think it is only the groundwater pathways, but Appendix F indicates other pathways, such as external radiation exposure from soil, are also evaluated. If the table is indeed only for groundwater pathways, then where are the results for the other pathways discussed in Appendix F? For each dose result, it should be clear which exposure scenarios in Tables F.35 and F.37 are being used. The third point of confusion is that the reader must go back and forth between the main document, the appendices, and outside documents, to find the details of the results given in the tables. Even then, it is still not clear as to which exposure scenarios are used, and what model parameter values are assumed.

182

The Draft HSW-EIS tends to ignore a number of health assessment/impact issues

- The Draft HSW-EIS does not allow meaningful comparisons with other state and federal programs responsible for the protection of public health and the environment, the USDOE needs to use standards and methodologies consistent with other federal and state programs for assessing and managing the risks of hazardous substances.
- The Draft HSW-EIS does not develop exposure scenarios for sensitive populations, children, and populations that may be at a disproportionate risk, i.e., Native American populations.
- The Draft HSW-EIS does not make valid assumptions for Technetium-99 (Tc-99) contamination for the 200 West Area. Incorrect assumptions are made regarding the grouted vs. non-grouted Tc-99.
- The Draft HSW-EIS does not clearly indicate what pathways and parameter values were used for each dose result.

183

The Draft HSW-EIS does not specify which model was used to evaluate the exposure scenarios. If the computer model RESisual RADioactivity (RESRAD) was used to calculate the doses, it would facilitate the review of impacts to have one example of a RESRAD input and output file as part of Appendix F. Inclusion of these files would clarify which parameters were used, and their values, without having to refer to other documents. In compliance with 40 CFR Part 1502.24, the discussion of analysis in the EIS "shall identify any methodologies used and shall make explicit reference" to the sources used for the conclusions. Several sections of the Draft HSW-EIS did not provide adequate reference for the conclusions provided.

Uncertainty Assessment and Quantification

184

The uncertainty inherent in the Draft HSW-EIS assessment should be analyzed and quantified. A statistical comparison should be made on dominance and significance of individual elements such as inventory, groundwater and vadose zone flow and transport, and the effect of data gaps in calculating factors such as risk and toxicity for various alternatives.

Many studies have shown that several orders of magnitude of differences usually exist due to lack of information, data gaps, and the uncertainty associated with various elements of the analysis. The level of uncertainty that can be tolerated in the study results must be understood by the decision-makers. The assessment of uncertainty should be used to determine the usefulness of spending additional effort to reduce uncertainty. It should also be recognized that the uncertainty and dominance principles are coupled. Quantification, therefore, is required to determine the individual component's significance in impacts to the receptors. The assessment must not leave out any factors that dominate the results.

Consideration Of Closure, Long-Term Care And Costs Is Very Limited

185 One of the requirements of 40 CFR Parts 1501.2(b) and (c) include the adequate development of alternatives to enable the decision maker to compare economic and technical analysis. The Draft HSW-EIS does not deal in detail, if at all, with such long-term activities as site closure, corrective action, monitoring, maintenance, and post-closure institutional controls. Nor does it assess, or compare, either disposal alternatives or low and high volumes, according to the requirements imposed by each, and the costs of meeting those requirements. A cost-benefit analysis of the proposed alternatives, including factors not related to environmental quality, should be developed in compliance with 40 CFR Part 1508.23. These issues have not been adequately developed to evaluate the impact to the Hanford National Monument, Columbia River, or local populations. The economic impact of compliant closure, corrective action, monitoring, maintenance, and post-closure institutional controls have not been adequately addressed for an informed decision making process.

Transportation Concerns Are Not Addressed

186 The draft EIS addresses only on-site transportation of wastes, relying upon the generic and very dated Waste Management Programmatic EIS to cover how waste is transported to Hanford. Anyone who has driven along I-182 or SR-240 in the Tri-Cities area knows that land use along those routes has changed dramatically since the 1990 census used in the generic assessment of the proposed EIS. The Draft Solid Waste EIS also does not analyze rail transport on or off-site, even though rail transport is under active consideration.

NEPA Intent Not Adequately Met

187 Although NEPA calls for brevity and directs documents to "concentrate on issues that are truly significant," sufficient evidence needs to be presented to support the conclusions made in this document. NEPA goes on to say that the purpose of the NEPA process is "to help public officials make decisions that are based on the environmental consequences." The Draft HSW-EIS fails to meet NEPA requirements by:

- Not identifying significant issues of concern to the public raised both in final comments on the WM PEIS and in scoping of the HSW-EIS
- Not integrating NEPA and TPA requirements for the Hanford Site
- Failing to include an alternative not to import off-site waste to Hanford
- Not including a cost-benefit analysis to support alternatives considered
- Failing to fully describe cumulative actions and impacts
- Does not reference support documentation not available to the reviewer – thorough reviews are impossible when cross references are made without available

documentation that is not in the public domain, or available as technical literature or guidance

- Relying on reference to historical Hanford technical documentation, policy statements, or historical Hanford environmental impact statements to imply sufficient sufficient technical support for the development of exposure scenarios and the conduct of health and environmental evaluations in this Draft HSW- EIS.
- Not addressing its importance as precedent.

Principal Recommended Corrections to the Draft HSW-EIS:

188 - The Draft HSW-EIS should use the same enabling assumptions and modeling input parameters used in Wood (1995), the authorization basis for the LLBG.
189 - The source term should include the retrievable TRU waste until there is a firm commitment and budget for its removal, or there should be separate analyses that include the retrievable TRU waste.
190 - Releases should be modeled during operations, and should NOT begin in 2046.
191 - The Points of Compliance for each waste site should be at the fenceline of the waste management area.
192 - The possible need for corrective actions under RCRA should be addressed.
193 - The chosen presumption for remedial action at closure should be evaluated against other alternatives.
194 - Post-closure monitoring and long-term stewardship issues should be addressed.
195 - Alternatives put forward through the Performance Management Plan and other vehicles should be clearly addressed.

196 The purpose of the NEPA process is to provide decision makers with the background data to emphasize real environmental issues and alternatives. This information is to be provided in a full and fair discussion of significant environmental impacts. The environmental issues and alternatives re to be supported with evidence verifying the proposing agency has made the necessary environmental analysis. The Draft HSW-EIS does not identify and evaluate all reasonable alternatives which consider Washington State preferences and plans, the Draft HSW-EIS does not provide mitigative measure to restore the quality of the human environment or to avoid or minimize possible adverse effects of the proposed actions. Therefore, the Washington State Department of Ecology has determined that HSW-EIS is so inadequate that it precludes meaningful analysis; the Washington State Department of Ecology is requesting the USDOE provide responses to the general and specific comments, use comments to revise the Draft HSW-EIS, and prepare and circulate a revised Draft HSW-EIS.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47600 • Olympia, Washington 98504-7600
(360) 407-6000 • TDD Only (Hearing Impaired) (360) 407-6006

August 21, 2002

Mr. Michael S. Collins
U.S. Department of Energy
Richland Operations Office
P.O. Box 550 – A6-38
Richland, WA 99352-0550

Dear Mr. Collins:

Re: Draft Hanford Site Solid (Radioactive and Hazardous)Waste Program Environmental Impact Statement (DOE/EIS-0286D), April 2002

197 This letter transmits the Washington State Department of Ecology (Ecology) comments on the Draft Hanford Site Solid Waste Program Environmental Impact Statement (HSW-EIS) from the United States Department of Energy (USDOE). Our thorough review of the HSW-EIS has identified several omissions and inadequacies which we comment on through this letter and the enclosed *General Summary*. In addition, we have enclosed a very detailed *Table of Specific Comment* in an effort to provide specific ideas and language that would improve the HSW-EIS.

198 We had hoped that the HSW-EIS would contribute to our confidence both in how Hanford's waste is managed and in the safety and importance of Hanford's role in the overall cleanup of nuclear sites in the country. We are disappointed, therefore, that the Draft HSW-EIS fails to meet this expectation. In short, the Draft HSW-EIS does not provide adequate and much-needed information to help us or the public address major issues. For example:

199 • What is the net benefit or harm of importing additional wastes for storage, treatment or disposal at Hanford?
200 • Are there alternatives to burying minimally-treated waste in shallow, unlined trenches?
201 • What are the long-term costs and requirements for monitoring, maintaining, and preventing failures at, and radioactive releases from, waste sites, and how can we be confident that these activities will be effectively and accountably managed?

More specifically, we find the Draft HSW- EIS deficient in the following areas:

Scope is too narrow.

202 • The Draft HSW-EIS assumes that the 1997 Waste Management Programmatic Environmental Impact Statement (PEIS) adequately compared the effects of treatment and disposal facilities at various sites, but it did not. The PEIS relied on data now several

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Mr. Michael S. Collins
August 21, 2002
Page 2

202 (cont) years old and did not have available even the limited information about Hanford contained in the Draft HSW-EIS.

203
- The Draft HSW-EIS assumes continued or increased off-site low-level waste and mixed low-level waste disposal at Hanford. It does not separately assess needs for disposing Hanford waste, in spite of widespread requests for such analysis during the scoping comment period.

204
- The Draft HSW-EIS does not evaluate other options currently under active discussion, such as the lined, RCRA-compliant mega-trench for disposing of low-level waste, expanded use of the Environmental Restoration Disposal Facility (ERDF), permanent disposal of low activity wastes from Hanford tanks in a form other than glass, or storing and treating transuranic wastes from other sites.

Impact analysis is too limited.

205 The Draft HSW-EIS reaches conclusions without apparent adequate data and analysis. It fails to disclose what information was not available for use in arriving at conclusions.

206
- The Draft HSW-EIS does not include sufficient data about groundwater contamination and movement at Hanford.

207
- The Draft HSW-EIS does not include sufficient data about the extent and characteristics of wastes and contamination already in the ground at Hanford.

208
- The analysis of cumulative impacts from the proposed treatment and disposal activities, in conjunction with other reasonably foreseeable actions at Hanford, is extremely limited and not credible based on the material presented.

209
- The Draft HSW-EIS does not include data about the effects on the full range of plant and animal species, nor does it recognize USDOE's obligation to protect and restore priority habitat, even if it has been degraded by fire or pesticides.

Regulatory analysis is insufficient.

210
- The Draft HSW-EIS does not adequately address the challenges USDOE presently faces in complying with RCRA and state dangerous-waste regulations.

Consideration of closure, long-term care and costs is very limited.

211 The Draft HSW-EIS does not deal with such long-term activities as site closure, corrective action, monitoring, maintenance, and post-closure institutional controls. It also does not assess nor compare disposal alternatives or low and high volumes according to the long-term care requirements imposed by each, and the costs of meeting the requirements.

Transportation concerns are not addressed.

212 The Draft HSW-EIS addresses only on-site transportation of wastes, relying upon the generic and very dated PEIS to cover how waste is transported to Hanford. Anyone who has driven

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August 21, 2002
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212 (cont) along I-182 or SR-240 in the Tri-Cities area knows that land use along those routes has changed dramatically since the 1990 census used in the generic assessment of the PEIS. The Draft HSW-EIS also does not analyze rail transport on or off-site, even though rail transport is under active consideration.

Summary

213 We believe the Draft HSW-EIS represents a missed opportunity for moving the discussion of Hanford and nationwide nuclear cleanup to a more productive level. Ecology encourages USDOE to consider reissuing a second EIS which would provide a comprehensive vision that assures the safe treatment, storage and disposal of Hanford's waste, and evaluates alternatives and options for Hanford's role in supporting cleanup nationally. Based on this draft, neither the public nor the state of Washington can address these issues with any confidence. We are hoping that through a revised and more comprehensive Draft HSW-EIS we would be able to evaluate and if appropriate support decisions regarding import of additional wastes to Hanford, hazardous waste permitting activities related to burial grounds and treatment facilities, and several initiatives arising from the Cleanup Constraints and Challenges Team's work.

Thank you for the opportunity to comment on this important document

Sincerely,

Tom Fitzsimmons
Director

2 Enclosures

cc: Keith Klein, USDOE/RL
Mike Gearheard, USEPA
The Honorable Robert Wahpat, Chairman, Yakama Indian Nation
The Honorable Gary Burke, Chair, Board of Trustees, Confederated Tribes of the Umatilla Indian Reservation
The Honorable Samuel N. Penney, Chairman, Nez Perce Tribal Executive Committee
Stuart Harris, Confederated Tribes of the Umatilla Indian Reservation
Russell Jim, Yakama Indian Nation
Patrick Sobotta, Nez Perce Tribe
Michael Grainey, Oregon Office of Energy
Todd Martin, Hanford Advisory Board

Responses to Letter L095

Comments	Responses
1	The revised draft *Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement* (HWS EIS) includes a revised purpose and need statement that was developed in consultation with U.S. Environmental Protection Agency (EPA) and Washington State Department of Ecology (Ecology) staff.
2	During preparation of the draft HSW EIS, the U.S. Department of Energy (DOE) has been cognizant of issues raised during public review of related National Environmental Policy Act (NEPA) documents and other Hanford initiatives that address waste management issues. To the extent those issues or concerns were related to the HSW EIS, they are addressed in the HSW EIS. Specific responses to comments received on related NEPA documents are contained in the published versions of documents that have been finalized. The relationships of those documents to the HSW EIS are discussed in Section 1.5 of this document, and the summary also discusses areas of particular concern raised during review of the first draft HSW EIS.
3	This HSW EIS considers post-closure institutional controls (see Section 2.0) and costs (see Section 3.5) in its analysis beyond 2046. The radionuclides evaluated for groundwater transport are all generally very long-lived. With the exception of carbon-14 with a half-life of 5730 years, the half-lives are greater than 150,000 years. Thus, radioactive decay is negligible over the 10,000 years evaluation period. Ten half-lives is the general rule of thumb to calculate when radioactivity will approach zero. Figures showing key radionculide concentrations in groundwater over time for the 10,000-year period have been added to Section 5.3.
4	The analysis does include closure evaluations. The closure cover analyzed (modified Resource Conservation and Recovery Act [RCRA] Subtitle C cover) is shown in Figure 2.15. The development of borrow pits for closure material is described in Appendix D. As identified in Section 3.7 the costs for alternative groups do include the costs for capping. Details of the costs can be found in Appendix C of the Technical Information Document (FH 2002). The environmental analysis of these actions is contained in Section 5.0.

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Comments	Responses
5	The revised draft HSW EIS evaluates various forecast waste quantities that include only Hanford-generated waste, in addition to varying amounts of offsite waste. This evaluation reflects the uncertainty in waste quantities that Hanford might receive under the Waste Management Programmatic Environmental Impact Statement (WM PEIS) decisions for mixed low-level waste (MLLW), low-level waste (LLW), and transuranic (TRU) waste. The inclusion of a Hanford Only waste volume provides the basis for determining the incremental impacts of offsite waste. See Section 3.2 for a discussion of the different waste volumes addressed in this HSW EIS.
6	Radioactive solid wastes, including those containing polychlorinated biphenyls (PCBs) and other substances regulated under the Toxic Substances Control Act (TSCA), considered within this HSW EIS are shown in Figure 2.1. Brief descriptions of the waste streams are contained in subsequent sections. PCB-comingled waste is discussed in Section 2.1.3.3, and K Basin sludge is discussed in Section 2.1.3.7. Information on the volume of waste associated with each stream is contained in Section 3.4.
7	Sections 2 and 3 discuss new and modified facilities that will be required for each alternative group. These new and modified facilities are then included in the consolidated set of cost estimates discussed in Section 3.7 and in Table 3.6. Major modifications of new facilities are specifically addressed in Table 3.6.
8	Cost estimates were prepared for the continued operation of existing facilities, the modification of existing facilities, construction of new facilities, and operation of the new or modified facilities. Some operations, such as capping the Low Level Burial Grounds (LLBGs) and treatment of leachate from mixed waste trenches, would continue beyond 2046. These operations have been included as a separate category. The cost of each major facility for each alternative group is shown in Table 3.6. The increased costs for the operation of the LLBGs with the increased volume of waste in the Upper Bound waste volume estimates can be seen. Because the additional wastes in the Upper Bound waste volume do not need treatment, the costs for treatment facilities do not change. This revised draft HSW EIS contains updated cost information for all of the alternative groups evaluated. The environmental impacts of the alternative groups are summarized in Section 3.4; detailed environmental impact information can be found in Section 5 and its associated appendixes. The process for making NEPA decisions is discussed in Section 1.6.
9	Offsite treatment of non-conforming LLW is described in Section 3.0 as part of Alternative Group A. Offsite treatment of the non-conforming LLW would not be limited to Allied Technologies Group, Inc. (ATG). As an alternative to offsite treatment, onsite treatment of the non-conforming LLW would be performed in a new waste processing facility. This facility is described in Section 3.0 as part of Alternative Group B.

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10	A No Action Alternative under NEPA does not necessarily mean no action at all (see Council on Environmental Quality [CEQ] Forty Most Asked Questions, Question 3, No Action Alternative [46 FR 18026]). Pursuant to the HSW EIS Notice of Intent (65 FR 10061), under the no action alternative, "DOE would continue ongoing waste management activities and implement those actions for which NEPA reviews have been completed and decisions made [the baseline for analytical purposes would be the time of issuance of the first draft HSW EIS]. The no action alternative provides a baseline for comparison of the environmental impacts of the proposed action and its alternatives." Discussion of a "stop action" scenario has been added in Section 3.0.
11	Ecology is reading the table correctly. The 218-W-3A Burial Ground is full. Alternative 1 would use an additional 0.2 hectares of the 218-W-3AE Burial Ground. Alternative 2 would use an additional 8.0 hectares of the 218-W-3AE Burial Ground. This table has been revised to address additional alternatives evaluated in this revised draft HSW EIS.
12	The HSW EIS evaluation did not assume the use of the 218-W-5 contingency expansion area. Additional analysis would be needed if it were to be used in the future.
13	The Central Waste Complex (CWC), Waste Receiving and Processing Facility (WRAP), LLBGs, and T Plant have been analyzed separately using the best available data from the Solid Waste Information Tracking System (SWITS) and other sources.
14	The maximum impact year for each alternative is calculated using conservative assumptions. As a result, several of the alternatives' largest pollutant sources are projected to be active during the maximum impact year. Because of scheduling constraints (e.g., project durations that extend over multiple years, activities that cannot start until a proceeding activity is completed, work force limitations), it is not credible to shift additional major pollutant-generating activities into the maximum impact year without simultaneously shifting other major pollutant-generating activities out of the maximum impact year. A change in the schedule of activities for the maximum impact year would typically do one of the following: • Shift the year of the maximum air quality impact to a new year. The magnitude of the maximum air quality impacts to the public would remain the same or decrease. • Maintain the same year of maximum air quality impact. The magnitude of the maximum air quality impacts to the public would remain the same or decrease.

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	Given the technical and work constraints outlined in planning for the Hanford Solid Waste Program, we do not foresee a credible scenario in which a scheduling change could significantly increase estimates of maximum air quality impacts beyond what is presented in this EIS. Estimates of the cumulative amount of a pollutant emitted over the life of each alternative were not used in this EIS to characterize air quality impacts to the public. For a project as complex as the HSW program, the correlation is quite poor between the cumulative pollutant emissions over multiple years and air quality impacts to the public. This is owing to the large variation in pollutant emissions that may occur from year to year, the large number of widely dispersed pollutant emission sites, and the wide variation in distances between the pollutant emission sites and publicly accessible locations. To illustrate this point, let's consider a scenario in which we would have a certain amount of carbon monoxide that would be uniformly emitted from Area C over the duration of the program. Let's assume that under a different alternative ten times this amount of carbon monoxide would be emitted from the 200 East Area. Because Area C is so much closer to publicly accessible locations than is the 200 East Area, Area C's unit dispersion factor for a maximum 1-hour impact is 40 times larger than the factor for the 200 East Area (see Tables 5.2 and 5.3). As a result, the maximum 1-hour air quality impact from the Area C emissions would be substantially greater than the impact from the much larger 200 East Area source. This example illustrates that the use of cumulative pollutant emissions would in many cases poorly correlate with air quality impacts.
15	The WM PEIS was a comprehensive evaluation of DOE nationwide waste management, and DOE determined there was sufficient information to make decisions regarding the sites that were suitable for long-term waste management missions. The WM PEIS evaluated a broad suite of alternatives for waste management across the DOE complex, including leaving most waste at generator facilities, or consolidating waste management at fewer sites that have existing facilities suitable to accept waste from other facilities. DOE decided that the environmental and programmatic benefits of consolidated waste management at sites with extensive waste management experience, including Hanford, were preferable to other alternatives evaluated. A more comprehensive discussion of the WM PEIS and its relationship to the HSW EIS can be found in Section 1.5. The HSW EIS was never intended to be a nationwide analysis, but to evaluate the consequences of various site-specific alternatives consistent with the WM PEIS decisions at Hanford. The first draft HSW EIS evaluated a range of waste receipts at Hanford to encompass the uncertainties regarding quantities of waste that would ultimately be managed at the site. The waste volumes evaluated in the first draft included a Lower Bound waste volume consisting mainly of Hanford waste, and an Upper Bound volume that included additional quantities of offsite waste Hanford might receive consistent with WM PEIS decisions. The revised draft HSW EIS includes an evaluation of Hanford Only

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	waste, in addition to the waste volumes that were included in the first draft. The Hanford waste evaluation provides a basis with which to determine the impacts of varying quantities of offsite waste at Hanford.
16	In general, waste disposed of prior to 1970 will be addressed through Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) response activities or other NEPA documentation, as appropriate. The LLBGs are eight specific solid waste disposal facilities in the 200 East and 200 West Areas, which have been in operation since 1962. Waste disposed of in the LLBGs prior to 1970 is evaluated as part of the alternatives in this HSW EIS. Cumulative impacts of waste remaining onsite, including waste disposed of prior to 1970, are addressed in Section 5.0 and Appendix L. Uncertainties in this inventory of waste are discussed in Section 3.0.
17	See the last paragraph of Section 2.1.3. This paragraph indicates that some TRU waste will be mixed, but because it will be shipped to the Waste Isolation Pilot Plant (WIPP) untreated there is no distinction between mixed and non-mixed TRU for the EIS.
18	Uncertainties about hazardous chemical constituents in the previously disposed of waste are discussed in Section 3.5 This waste will ultimately go through a CERCLA or RCRA past-practice remedial action process prior to closure of the LLBGs.
19	The summary has been extensively revised and DOE elaborates further on the cumulative impacts in Section 5.14 and Appendix L.
20	This is an estimate that up to four fatalities *might* occur and does not mean that the accidents will occur. This is a statistical estimate of traffic accident fatalities based on historical data. This was a bounding case assuming that contact-handled (CH) MLLW would be sent to Tennessee for treatment. Other alternatives evaluate treatment of this waste onsite.
21	The cumulative impacts analysis addresses initial results of the System Assessment Capability (SAC) analyses, which were based on available data and assumptions about waste inventories in various waste sites at Hanford. Various disposal records, process information, and groundwater/vadose zone monitoring data were used to estimate the inventories at these waste sites. (See Section 5.14 and Appendix L in Volumes I and II of this HSW EIS.) Waste to be disposed of in the future, from onsite or offsite generators, is analyzed as a part of all of the alternative groups in this HSW EIS. This HSW EIS also evaluates various forecast waste quantities that include Hanford Only generated waste in addition to varying amounts of offsite waste. This evaluation reflects the uncertainty in waste

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quantities that Hanford might receive under WM PEIS decisions for MLLW, LLW, and TRU waste. The inclusion of a Hanford Only waste volume provides the basis for determining the incremental impacts of offsite waste.

22 Wastes disposed of in the LLBGs since they opened in 1962 are evaluated in this HSW EIS. Wastes disposed of prior to 1962 are addressed as part of the cumulative impacts (see Sections 5.14 and Appendix L). Uncertainties about hazardous chemical constituents in the previously disposed of waste are discussed in Section 3.0. This waste will ultimately go through a CERCLA or RCRA past practice remedial action process prior to closure of the LLBGs.

23 The WM PEIS evaluated a broad suite of alternatives for waste management across the DOE complex, including managing most waste at generator facilities, or consolidating waste management at fewer sites that have existing facilities suitable to accept waste from other facilities. The impacts of those alternatives were compared for a variety of waste volumes at different DOE sites, including larger quantities of waste than are evaluated in this HSW EIS. As a result of that analysis, DOE decided the environmental and programmatic benefits of consolidated waste management at sites with extensive waste management experience, including Hanford, were preferable to other alternatives evaluated. An expanded discussion of the WM PEIS alternatives is provided in Section 1.5 of the revised draft HSW EIS.

24 This language is no longer used in this HSW EIS.

DOE's basis for regulation of DOE LLW is set forth beginning at page A-152 of Appendix A of the "Implementation Guide for use with DOE M 435.1-1." Appendix A can be accessed at URL: http://www.directives.doe.gov/. Appendix A states that:

"The regulation of low-level waste at DOE facilities, as developed in DOE Order 435.1, differs from the more generic but prescriptive approach taken by the NRC in developing requirements for commercial facilities in 10 CFR Part 61 and other rules. 10 CFR Part 61 was developed with several known conditions that are specific to commercial waste and are not necessarily appropriate for DOE low-level waste. These differences include (1) NRC has a formal licensing process while DOE uses the Directives process; (2) NRC requirements are for generic but unknown facilities and locations; (3) commercial waste streams are well defined; (4) DOE processed spent fuel for spent nuclear material; (5) DOE disposes of low-level waste onsite, where practical, at facilities which have been operating for many years; (6) land use controls for DOE low-level waste disposal facilities are likely to extend into the distant future; and (7) the management structure for DOE nationwide low-level waste management is well established. These factors lead to differences in waste management regulation and practices for DOE and NRC low-level waste disposal; however, the required level of health protection is essentially identical.

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	One specific result of the differences in the process used by DOE to regulate low-level waste is the approach to waste classification. The NRC developed a generic waste classification system for application to all facilities and all locations, which was based on a well-developed understanding of the characteristics of commercial low-level waste. The waste classification limits were developed from a performance assessment of generic low-level waste disposal facilities in various locations that was included in the Environmental Impact Statement for 10 CFR Part 61. The DOE approach places greater emphasis on site-specific decisions for site-specific conditions, and requires a site-specific performance assessment to develop limits, on the basis of criteria for radiation protection (dose limits) that are similar to the NRC. This approach recognizes that the locations for the disposal of wastes are well known, but the waste characteristics are not as well understood. DOE Manual 435.1-1 requires the development of waste acceptance criteria for each waste management facility to ensure justified limitations are placed on wastes to be disposed of. Sites may establish waste classifications as needed for operation of specific facilities, but they must establish waste acceptance criteria. This approach leads to the development of site-specific systems which take into account the environmental characteristics of the site and the characteristics of the wastes being disposed of, such as the Category 1 and 3 designations at Hanford, which are similar to the NRC classes A and C."
25	This language is no longer used in this HSW EIS. This waste will ultimately go through a CERCLA or RCRA past practice remedial action process prior to closure of the LLBGs. TRU waste that is retrieved from the LLBGs will be stored, treated, characterized, packaged, and shipped to WIPP for disposal.
26	This language is no longer used in this HSW EIS. Information on the canyon disposal initiative can be found in Section 3.0.
27	This revised draft HSW EIS evaluates Hanford Only waste volumes. There are only minor differences between the Hanford Only waste volume and the Lower Bound waste volume.
28	The basic decision for retrievably stored suspect TRU waste is to determine whether it is TRU waste or LLW. If the waste is determined to be TRU waste, it will be retrieved and shipped to WRAP or another facility for certification prior to being shipped to WIPP for disposal. The basis for the 50% estimate is an analysis of waste records.
29	1. The current inventory of waste stored and/or disposed of at Hanford includes wastes received from offsite sources in the past. Estimates for future waste shipments from offsite sources are not included in the Hanford Only waste volume. 2. The waste volume is correct and based on conversations with Oak Ridge staff. They are not listed in the text because they don not currently send us waste and therefore are

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not included in the SWIFT forecast. Discussion with Oak Ridge Operations Office indicated that the smaller volume of waste was the maximum amount that would potentially be shipped to the Hanford Site. This has been included in the Upper Bound waste volume. Based on the WM PEIS decision, Oak Ridge will continue to manage most of its own waste.

3. The isotopic characteristics of the additional offsite waste included in the Upper Bound waste volumes were based on radionuclide profiles contained in *The Current and Planned Low Level Waste Disposal Capacity Report* (DOE 1998). A summary of long-lived radionuclides for all waste streams is included in tables in Appendix F in Volume II of this HSW EIS.

The chemical content for the Hanford Only and Lower Bound volumes comes directly from the SWIFT forecast. The chemical content of the additional offsite waste included in the Upper Bound volumes was extrapolated from information contained in the Solid Waste Information and Tracking System (SWITS) database.

30 In Appendix B, Tables B.11 through B.13 contain the volumes of CH and RH TRU waste to be managed (totals ranging from 45,748 to 47,305 m^3). The total volumes of TRU waste expected to be shipped to WIPP range from 41,512 cubic meters (Hanford Only TRU waste) to 43,036 cubic meters (Upper Bound waste) with the volume of RH-TRU waste at about 2500 cubic meters in both cases. The flow diagrams in Appendix B, Section B.5, provide further explanation.

The TRU Management Plan, Rev 3, shows an anticipated total volume of about 33,500 cubic meters of TRU at Hanford. The TRU waste sites provided volume information to TRU Management Plan in the Integrated Planning, Accountability, and Budgeting System (IPABS) management tool. There are differences because IPABS and the TRU Management Plan are based on a best estimate and the HSW EIS is based on conservative estimates.

TRU Management Plan Rev 3 (page 37) (available on line at http://www.wipp.carlsbad.nm.us/library/ntwmp/rev3/Cover.pdf) states that the anticipated volume of DOE waste to be disposed of at WIPP is 116,100 cubic meters, of which 113,300 cubic meters is CH TRU (of which about 3,200 cubic meters has already been disposed of), and 2,800 cubic meters is RH TRU waste. WIPP's total capacity for both CH-TRU waste and remote-handled (RH) TRU waste is set at 175,600 cubic meters by the Land Withdrawal Act. The total volume of RH-TRU waste cannot exceed 7,080 cubic meters.

31 The volume listed in the 1996 Integrated Database (640,000 m^3) includes all non-TRU waste buried from 1944 through 1996. The "previously disposed of" figure for LLW (283,067 m^3) includes only LLW buried in the LLBGs that are the responsibility of the

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Waste Management Project (from approximately 1962 through 1998). The remainder consists of the naval reactor compartments and waste in pre-1970 burial grounds that will eventually be addressed under CERCLA.

32 The use of rail is not part of the proposed action evaluated in this HSW EIS. Shipments of waste by rail may require constructing a spur from the existing rail lines, which, if proposed, would require additional NEPA review.

33 The LLW uranium inventories evaluated in the HSW EIS include the 825 MTU that may be eventually disposed of at Hanford. It is included in the source term. The analysis conducted under this EIS did not indicate that groundwater standards for total uranium would be exceeded (see Section 5.3 and Appendix G of this HSW EIS).

34 Specific discussion of the use of soil mounds over trenches as an interim measure to shed water has been included in this HSW EIS. Section 5.18.1 addresses potential groundwater mitigation measures, and DOE considers early capping as part of this discussion. The SAC analysis demonstrated that some advantages are associated with early capping.

For purposes of modeling groundwater impacts it is more conservative to assume that trenches are capped at the end of the operating period.

35 Studies of seismicity at the Hanford Site have shown that the depth of seismic activity is related to crustal stratigraphy (layers of rock types) (PNNL-11557-20). The main geologic units important to earthquakes at Hanford and the surrounding area are

-
-
-
  Paleozoic craton
-

Since records have been kept, most of the earthquakes at the Hanford Site have originated in the Columbia River Basalt Group. The crystalline basement has had the next greatest amount of earthquakes followed by the pre-basalt sediments. However, the stratigraphic distribution of earthquakes will vary on a yearly basis. For example in FY 1999, 39 earthquakes occurred in the basalt layer, 6 were in the pre-basalt sediments, and 27 were in the crystalline basement (PNNL-11557-12). In contrast, for FY 2002, there were 13 earthquakes in the basalt layer, 12 earthquakes in the pre-basalt sediments, and 17 earthquakes in the crystalline basement (PNNL-11557-20) (Hartshorn et al. 1999, Hartshorn et al. 2002).

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36	Two earthquakes triggered the Hanford Strong Motion Accelerometers during the five years of its operation. Additional information on this subject can be found in the Annual Hanford Seismic Report for FY 2001 (Hartshorn et al. 2001).
37	Section 3.7 of the first draft HSW EIS presents the consolidated cost estimates for each alternative. Section 3.5 of the revised draft HSW EIS updates those costs for the alternatives considered in the revised document. The detailed cost estimates are contained in Appendix C of the Technical Information Document ID (FH 2002), which is available over the Internet at http://www.ecy.wa.gov/programs/nwp/pdf/HSW EIScomments.pdf.
38	Section 5.11.1.1.3 describes the evaluation of the postulated accident scenarios involving radioactive material. These scenarios included a design basis earthquake and a beyond design basis earthquake. Additional details regarding this evaluation are in the Central Waste Complex Interim Safety Basis (Vail 2001a) and Solid Waste Burial Grounds Interim Safety Analysis (Vail 2001b and Vail 2001c) documents.
39	A systematic evaluation of the water lines will be performed to determine if any of these water lines are located near waste sites that are subject to near-term remedial or closure actions. Moving water lines away from waste sites that are to be isolated with surface barriers will eliminate the potential for leaking lines to flush contaminants from the vadose zone. In some situations a field survey of the lines will be performed to identify areas where this type of situation may exist. Finally, water lines to certain inactive facilities may not be needed and could simply be capped and shut down. Plans are to complete water system renovation of the Central Plateau by 2008 (DOE-RL 2002).
40	"Other solid waste" means non-radioactive, non-hazardous routinely generated garbage.
41	The principal criterion for "other suitable facilities" would be facilities where we would have the capability to conduct inspection and verification of wastes for treatment or disposal.
42	DOE welcomes specific suggestions on this topic. In Section 6, we identify the regulatory requirements followed in conducting operations at Hanford Site, including RCRA and State Dangerous Waste Regulations under the Hazardous Waste Management Act (Section 6.3). Section 6.19 addresses permits required to construct and operate treatment, storage, and disposal facilities related to the alternatives. Whenever we discuss facilities involved with treatment and storage and disposal of mixed waste, it is our intent to comply with all applicable requirements.

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43	Implementation of the No Action Alternative would not enable DOE to comply with the waste management and land disposal requirements of the State Dangerous Waste Regulations (including RCRA requirements). Text in this HSW EIS (Section 3.0) addresses this issue.
44	Text has been added to Appendix D, Section D.1, of the revised draft HSW EIS to clarify the regulatory status of the LLBGs.
45	Table 6.1 of the first draft HSW EIS was not intended to be all inclusive, but to avoid confusion we revised the text and removed the table from the revised draft HSW EIS.
46	The analysis of commercial facilities is performed as part of facility-specific NEPA documentation or similar State documentation, for example, ATG was analyzed as part of a City of Richland State Environmental Policy Act EIS. There is no intention to receive MLLW from offsite for storage, send it back out to a commercial treatment facility, and then return it back to Hanford for disposal. All MLLW from offsite generators is assumed to be treated prior to being received at Hanford for disposal. Contact-handled MLLW generated at Hanford would be sent offsite to a commercial treatment facility in some alternatives.
47	The descriptions of closure and cap components in the first draft HSW EIS are intended to summarize actions that will be addressed in detail in the dangerous waste management documentation required by Washington Administrative Code (WAC) 173-303. MLLW units are to be closed in accordance with WAC 173-303-610 regulations. For purposes of analysis at this time, it is reasonable to expect that LLBG mixed waste disposal units will be closed with environmentally protective caps and other controls as required. Post-closure is part of the long-term stewardship activities discussed in Section 5.18.
48	The WM PEIS was a comprehensive evaluation of DOE nationwide waste management, and DOE determined there was sufficient information to make decisions regarding the sites that were suitable for long-term waste management missions. The HSW EIS evaluates alternatives for consistent with the WM PEIS decisions at Hanford, and does not repeat the nationwide comparison of impacts across DOE sites contained in that document. A discussion of the WM PEIS and its relationship to the HSW EIS can be found in Section 1.5. Not withstanding the above, as encouraged by Ecology and others, the HSW EIS includes an evaluation that assumes only Hanford wastes are managed at Hanford in the future.
49	The HSW EIS now includes alternatives for creating new spaces for disposal of waste outside the LLBGs as suggested by Ecology and others.

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50	Capabilities needed for remote-handled (RH)TRU wastes and non-standard containers of TRU waste would be similar to those already provided in WRAP. These include nondestructive examination, nondestructive assay, headspace gas sampling, repackaging, and visual examination of waste packages. These are described in various text boxes in Section 2.2.2. Additional capacities for processing and certifying CH-TRU waste would increase throughput and accelerate shipment of TRU waste to WIPP.
51	The proposed modifications are discussed in a "modified T Plant" text box in Section 2.2.2. Without additional capabilities to process RH-TRU waste and non-standard containers of TRU waste, these wastes could not be certified and shipped to WIPP. Modifying T Plant is one alternative analyzed that would help us to certify TRU waste.
52	WIPP has applied for changes to its permit to allow it to receive waste containing polychlorinated biphenyls (PCBs). EPA has indicated acceptance, but it is not final yet. Based on the assumption that the changes will be accepted, the sludge would not require treatment of PCBs.
53	There are uncertainties regarding timing of TRU waste receipts and the volume of wastes received, because CERCLA decisions have not been made. See Section 3.0 in this HSW EIS.
54	The term "cover" as used here means the backfill placed over the waste and trench to bring the level to grade. Cover has been changed to backfill in the revised draft HSW EIS. Caps are applied later to reduce water penetration into the waste.
55	The performance of the burial grounds and the value of cement as a waste form were assessed in specific performance assessments for the 200 East and 200 West burial grounds. The documents (listed below) were reviewed by a peer review panel before they were issued and are reviewed annually for any significant changes. The performance assessment showed the results for the 1,000-year compliance period, while the EIS analysis addresses the impacts over the 10,000-year time frame (Wood et al. 1995, Wood et al. 1996).
56	Yes. Please see Response 55.
57	DOE Order 460.1A sets out DOE policy on packaging and transportation safety. The Order states that onsite hazardous materials transfers shall comply with the U.S. Department of Transportation (DOT) hazardous materials regulations, or the site- or facility-specific cognizant DOE Operations or Field Office approved Transportation Safety Document that describes the methodology and compliance process to meet equivalent safety for any deviation from the hazardous materials regulations. For offsite

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	hazardous materials packaging and transportation safety, DOE's policy, as stated in DOE Order 460.1A, is that each package and shipment of hazardous materials shall be prepared in compliance with the DOT hazardous materials regulations and applicable tribal, state, and local regulations not otherwise preempted by DOT. DOE does not use the U.S. Nuclear Regulatory Commission (NRC) Uniform Manifest.
58	DOE welcomes specific suggestions on this topic. In Section 6, we identify the regulatory requirements followed in conducting operations at Hanford Site, including RCRA and State Dangerous Waste Regulations under the Hazardous Waste Management Act (Section 6.3). Section 6.19 addresses permits required to construct and operate treatment, storage, and/or disposal (TSD) facilities related to the alternatives. Whenever we discuss facilities involved with treatment, storage, and disposal of mixed waste, it is our intent to comply with all applicable requirements. DOE acknowledges the dual regulatory authority of EPA and the State of Washington under RCRA and CERCLA and is committed to complying with all applicable requirements. DOE is addressing the uncertainties associated with burial ground performance and characterization through the CERCLA and RCRA past practice processes.
59	The 200 Area LERF is regulated under the Dangerous Waste Portion of the Hanford RCRA permit and is subject to requirements for groundwater monitoring under WAC 173-303-645. Due to declining water table levels under the 200 Area, the LERF groundwater monitoring system could no longer perform effectively, and alternative environmental monitoring methods had to be examined. Ecology has reviewed DOE's draft plans (Ecology, February 7, 2002), and is working with DOE to resolve remaining issues (Ecology, July 1, 2002).
60	The text has been revised.
61	The text has been revised.
62	Yes, all floors are inspected and repaired as necessary.
63	Biological and ecological resources (vegetation, wildlife, aquatic ecology, and threatened and endangered species) potentially impacted by the proposed actions are assessed in Appendix I and summarized in Section 4.6 of this HSW EIS. Wildlife species evaluated and ecological resource impacts are summarized in Section 5.5 of this EIS.
64	Thank you.
65	Hanford shrub-steppe is identified as a priority habitant in Section 4.6.4 of this HSW EIS.

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66	Figures showing concentrations over the entire 10,000-year time period have been added in Section 5.3 and Appendix G.
67	The natural vegetation is expected to be reestablished after closure of the disposal facilities and the borrow area. Potential mitigation measures for addressing ecological impacts are described in the Biological Resources Management Plan (BRMaP) and the Biological Resources Mitigation Strategy (BRMiS), which are discussed in Section 5.18 of this HSW EIS.
68	No mining in the 300 Area or Fitzner/Eberhardt Arid Lands Ecology (ALE) Reserve portions of the National Monument is projected. Area C where mining may occur is outside of ALE, but close enough for noise consideration. This impact on wildlife from such noise is addressed in Section 5.9.
69	Microbiotic crusts are discussed in Appendix I. To clarify the potential impact of solid waste management alternatives at Hanford to the crusts we have included this discussion in the descriptions of the Affected Environment (Section 4) and Environmental Consequences (Section 5), and Appendix I.
70	We did not omit consideration of other habitats based upon non-priority status (see Section 5.5 and Appendix I).
71	This HSW EIS has been revised to reflect the survey results and we expect to do periodic surveys in the future.
72	The approach taken in the HSW EIS is consistent with the methods, characteristics, and controls associated with a composite analysis as described by the Columbia River Comprehensive Impact Assessment (CRCIA) team. The analysis modules included in the SAC parallel those identified by CRCIA and were developed through work group meetings that included regulator and stakeholder participation. Several key modules were adopted directly from the CRCIA including the module used to calculate human health impacts (the HUMAN code) and the module used to calculate impacts to ecological species (the ECEM code).
73	The CRCIA (DOE-RL 1998) was a study initiated by DOE, Ecology, and EPA to assess the effects of Hanford-derived materials and contaminants on the Columbia River environment, river-dependent life, and users of river resources for as long as these contaminants remain intrinsically hazardous. The acronym CRCIA is identified in Volume 1 and document mentioned in Volume II, Appendix F, but the formal citation was not placed in the reference section.

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	CRCIA was developed to provide screening, impact, and risk assessment procedures to be used under the Hanford TPA, the RCRA, and CERCLA programs. The approach taken in the first draft HSW EIS is consistent with the methods, characteristics, and controls associated with a composite analysis as described by the CRCIA team. Key elements of the approach include ensuring that factors that will dominate the risk are included and providing an understanding of the uncertainty of the results. Dominant factors were identified through scoping studies and the development of conceptual models for each of the analysis modules used. A stochastic modeling approach was taken to estimate uncertainty in the results. Aspects of uncertainty that could not be included in the calculation were considered in the analysis of the modeling results and discussed in the document presenting those results (PNNL 14027). The analysis modules included in the System Assessment Capability parallel those identified by CRCIA and were developed through work group meetings that included regulator and stakeholder participation. Several key modules were adopted directly from the CRCIA including the module used to calculate human health impacts (the HUMAN code) and the module used to calculate impacts to ecological species (the ECEM code).
74	MLLW will be treated to remove organics. With regard to previously buried waste, there is insufficient information about the constituents and/or inventory of these to do groundwater modeling and subsequent ecological risk assessment. The TRU waste will be removed and sent to WIPP and thus pose no concern to Hanford Site biota. The concern about the contaminants analyzed in the ecological risk assessment is that of their radiological rather than their chemical toxicity, with the exception of uranium, for which there was analysis for both.
75	The EPA provides a general protocol with considerable latitude for conducting ecological risk assessments, into which the framework of the HSW EIS ecological risk assessment falls.
76	Best estimates are median values from a range of laboratory samples. This is included parenthetically in this HSW EIS.

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77	DOE uses two definitions of the term "seeps." On the Columbia River, seepage occurs below the river surface and exposed riverbank, particularly noticeable at low-river stage. The seeps flow intermittently, apparently influenced primarily by changes in the river level. Use of the word seeps in this context corresponds to the commenter's definition. The second use of the term in the HSW EIS corresponds to releases of radionuclides and chemicals to the unsaturated soil beneath the LLBGs that may occur as the waste packages degrade and water (from rain and snow melt) "seeps" through the waste. While the term may not exactly correspond to the reference cited in the commenter's question, it is descriptive of the phenomena. Thus, using an additional dilution factor in this case is appropriate.
78	The K_d values referenced in Table I.2 come from Table G.1 (HSW EIS, Volume II, 2002). A footnote has been added to Table I.2 to reflect this fact.
79	The contaminant data used as ECEM model input is provided in Appendix I. The full suite of ECEM terrestrial and aquatic receptors is also provided. Information related to the model parameters and algorithms is contained in the Columbia River Comprehensive Impact Assessment part 1 (DOE/RL-96-16, Rev 1 and Final. U.S. Department of Energy, Richland, WA March 1998) and Eslinger, P.W., C. Arimescu, B.A. Kanyid, and T.B. Miley. 2002. User Instructions for the Systems Assessment Capability, Rev. 0, Computer Codes. Volume 2: Impact Modules. PNNL-13932-Volume 2, Pacific Northwest National Laboratory, Richland, Washington.
80	The uncertainty factor of 15 was used to convert a "chronic mortality" benchmark based on a 7-day test for the mosquitofish where the level of mortality was not specified, not an "acute mortality" benchmark, which is typically an LC50 based on a 4-day or shorter test (DOE 1998). The uncertainty factor of 15 was used to extrapolate from the mosquitofish to other Columbia River receptors exposed mostly to surface water (fish, freshwater shrimp, water flea, etc.). No further uncertainty factors are needed, because the general exposure scenario for the mosquitofish and receptors are similar. Since the first draft HSW EIS, new alternatives have been incorporated, necessitating new groundwater modeling of contaminants reaching the Columbia River, and hence a new assessment of potential risk of adverse effects to aquatic and riparian biota. The new assessment consists of a re-analysis of risk that uses new uranium chemical aquatic toxicity benchmarks.
81	Presence alone of threatened or endangered species or critical habitat does not necessitate formal consultation under the Endangered Species Act. The U.S Fish and Wildlife Service (FWS) letter of April 23, 2002, (see Appendix I) states that "...if a listed species is likely

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to be affected by the project, the involved Federal agency should request Section 7 consultation.…" According to the FWS Endangered Species Consultation Handbook, formal consultation is necessary 1) after the action agency determines that the proposed action may affect listed species or critical habitat, or 2) National Marine Fisheries Service (NMFS) or FWS does not concur with the action agency's finding that the proposed action is not likely to adversely affect the listed species or critical habitat. There are no threatened or endangered species or critical habitat in any of the terrestrial habitats to be disturbed under any of the alternatives in this HSW EIS (see Appendix I). Thus, because no threatened or endangered species or critical habitat is likely to be adversely affected, there is no basis for initiating formal consultation with either NMFS or FWS.

Regarding documentation for State-listed species of concern we assume the comment meant the Washington State Department of Fish and Wildlife not the U.S. Fish and Wildlife Service. Table 4.12 in this EIS identifies the Washington State-listed animal species of concern. This information was obtained from the website: www.wa.gov/wdfw/. Based on information provided subsequently from the Washington State Department of Fish and Wildlife (letter dated August 20, 2002), this EIS has been updated.

82 Uranium isotopes are the main constituents addressed by the HSW EIS analysis. The solubility and release of uranium disposed of in cementicious wastes (i.e., within high-integrity containers [HICs] or macroencapsulated in grout) is expected to be significantly reduced below expected solubility for uranium not disposed of in cementicious wastes. Release calculations for uranium isotopes are described in more detail in Appendix G.

83 This HSW EIS uses the definition of cumulative impact as defined by NEPA (40 CFR 1508.7):

"Cumulative impact" is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

84 The inventory estimated for mercury is small, 2.5 kg (5.5 lb), and would not contribute substantially to groundwater contamination. Given the small, estimated inventory, the decision was made to use a K_d value for mercury that is the same value as for lead. The values are based primarily on chemical similarity and solubility.

85 Environmental justice is concerned with assessment of disproportionate distribution of adverse impacts of an action among minority and low-income populations that is significantly greater than that experienced by the rest of the population. Adverse impacts

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are defined as negative changes to the existing conditions in the natural environment (for example, land, air, water, wildlife, vegetation) or in the human environment (for example, employment, health, land use). Executive Order 12898 further directed federal agencies to consider effects to "populations with differential patterns of subsistence consumption of fish and wildlife."

DOE is cognizant of the concern of Native Americans and others that operations at Hanford, including those discussed in this HSW EIS, will adversely impact Native Americans and other minority and low-income populations. One of the concerns, as it applies to Native Americans, is that through their lifestyle (e.g., a higher percentage of fish in the diet when compared to other demographic groups) they would be affected disproportionately more than other populations through operations at Hanford, and the by pollution from those operations, of the groundwater and the Hanford Reach of the Columbia River. Groundwater modeling shows that the pollutants of concern (technetium- 99 and iodine-129) where affected groundwater interdicted with the Columbia River would be significantly diluted. The groundwater itself, at a hypothetical well l km from the Columbia River would be well within benchmark maximum contaminant levels.

In addition, often cited in support of disproportional adverse impacts of Hanford's operations on the Columbia River and Native Americans is a U.S. Environmental Agency Report entitled "Columbia River Basin Fish Contaminant Survey 1996-1998. (EPA 910-R-02-006. Region 10, Seattle, WA). EPA did a special study of radionuclides for a limited number of fish samples on the Hanford Reach. White sturgeon were collected from the Hanford Reach of the Columbia River, artificial ponds on the Hanford Site, and from the upper Snake River and analyzed for radionuclides. The levels of radionuclides in fish tissue from Hanford Reach of the Columbia River and the ponds on the Hanford Site were similar to levels in fish from the Snake River. Cancer risks were estimated for consumption of fish that were contaminated with radionuclides. These estimates of risks were not combined with the potential risks from other chemicals, such as PCBs (Aroclors and dioxin-like PCBs), chlorinated dioxins and furans, and a limited number of pesticides. The potential cancer risks from consuming fish collected from Hanford Reach and the artificial ponds on the Hanford Site were similar to cancer risks in fish collected from the upper Snake River. These risks were small relative to the estimated risks associated with radiation from naturally occurring background sources, to which everyone is exposed.

EPA's study reported that the chemicals and or chemical classes that contributed the most to cancer risk for most of the resident fish were PCBs (Aroclors and dioxin-like PCBs), chlorinated dioxins and furans, and a limited number of pesticides. For most of the anadromous fish, the chemicals that contributed the most to cancer risk were PCBs (Aroclors and dioxin-like PCBs), chlorinated dioxins and furans, and arsenic.

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DOE has been monitoring radionuclides and chemical constituents in fish in the Hanford Reach since 1945 (Poston, T. M., R. W. Hanf, R. L. Dirkes, and L. F. Morasch. 2002. *Hanford Site Environmental Report*, PNNL-13910, Pacific Northwest National Laboratory, Richland, Washington).

A Native American scenario was evaluated in the TWRS EIS (DOE and Ecology 1996). This HSW EIS evaluated the impacts of a sweat lodge as part of its exposure scenarios (see Appendix F).

86 DOE is cognizant of the concern of Native Americans and others that operations at Hanford, including those discussed in this HSW EIS, will adversely impact Native Americans and other minority and low-income populations. One of the concerns, as it applies to Native Americans, is that through their lifestyle (e.g., a higher percentage of fish in the diet when compared to other demographic groups) they would be affected disproportionately more than other populations through operations at Hanford, and by the pollution from those operations, of the groundwater and the Hanford Reach of the Columbia River. Groundwater modeling shows that the pollutants of concern (technetium-99 and iodine-129) where affected groundwater interdicted with the Columbia River would be significantly diluted. The groundwater itself, at a hypothetical well l km from the Columbia River would be well within benchmark maximum contaminant levels.

The HSW EIS evaluates the impacts of three exposure scenarios, one of which includes a sweat lodge. These scenarios are consistent with EPA, Model Toxics Control Act (MTCA), and the Hanford Site Risk Assessment Methodology. The exposure pathways included ingestion, dermal absorption (bathing), biota, dairy, meat, game, fruit, vegetables, and inhalation. See Tables in Appendix F.

The risk factors for estimating health effects take into account exposure to children.

87 The applicable ambient air quality standards are found in Section 4 (Table 4.5) of this HSW EIS.

88 The HSW EIS is based on a very large body of information and has been revised to address many comments regarding its scope, organization, data presentation, and content.

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89	The maximum point of impact from multiple and widely dispersed sources is not necessarily directly underneath the LLBGs or at the LLBG boundary. To model the groundwater impacts from multiple and widely dispersed disposal units over long periods of time, a 1-km "point of analysis" location was deemed to be more appropriate and representative than a regulatory "point of compliance" well location. Current results from the RCRA-compliant groundwater monitoring have not identified any groundwater impacts from the LLBGs. The point of analysis approach is considered more technically appropriate for a NEPA evaluation of groundwater impacts. More specific clarification about the differences between the "point of assessment" used in the HSW EIS groundwater impact analysis and the RCRA "point of compliance" for land disposal unit groundwater monitoring wells is provided in Section 5.3 and Appendix G.
90	Modified RCRA Subtitle C covers are assumed to be used in all action alternatives.
91	Table G.4 and Figure G.3 have been added to Appendix G to help clarify infiltration rates.
92	The tables in Section 5.3 have been replaced by graphs that show groundwater concentration in relation to the drinking water maximum contaminant levels (MCLs).
93	The resident gardener scenario is modeled for two different time periods. During Hanford operations through the end of active institutional controls (about 2146), the resident gardener is 20.6 km ESE from the 200Areas (off the Hanford Site). This gardener is exposed via atmospheric releases. Sometime following the end of active institutional controls a hypothetical residential gardener is assumed to move onto the Hanford Site just above the point where groundwater will have maximum concentration, 1 km down-gradient from the disposal burial grounds. This hypothetical gardener is exposed via irrigation of crops using contaminated well water. The pathways reported in the tables will depend on when a scenario is modeled with respect to the end of operations. Parameters are summarized in Appendix F, and results presented in Section 5 of this HSW. Section 5.11 indicates that details of the scenarios are found in Appendix F. The location of the resident gardener corresponds to the points of analysis used in this comparative assessment. The points of analysis are located along lines approximately 1 km (0.6 mi) down-gradient from aggregate HSW disposal facilities within the 200 East Area, 200 West Area, the Environmental Restoration Disposal Facility (ERDF) areas, and near the Columbia River located down-gradient from all disposal facility areas. All locations were selected based on simulated transport results of unit releases at selected HSW disposal facility locations. Points of analysis approximately 1 km down-gradient from the overall waste disposal facilities in each area are not meant to represent points of compliance but rather common locations to facilitate comparison of impacts from broad waste management selections and locations defined for each alternative.

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	The HSW EIS is based on a very large body of information and has been revised to address many comments regarding its scope, organization, data presentation, and content.
94	Atmospheric models limit the location of receptors to no closer than 100 m.
95	Appendix F has been modified to clarify the location of the resident gardener in the resident gardener scenario. (Please see Response 93, too.)
96	Footnote (b) in Tables 5.18 and 5.19 have been revised to specify Section F.1.7 in Appendix F.
97	Information has been added to indicate that these doses are below the 10-mrem/rear dose limit in the Washington State air regulations see Section 5.11.1.1.2. 1).
98	A single conversion factor(0.0006 latent cancer fatality [LCF]/person-rem) is used in this revised draft HSW EIS (see Section F.1.7).
99	Yes. The discussion refers to the 50-year committed effective dose equivalent (CEDE) that would be received by the individual after the initial intake of contamination.
100	The impacts to the groundwater at a point 1 km down-gradient of the disposal facilities are addressed in Section 5.3 and Appendix G. The impacts to a resident gardener from drinking water at this same point are addressed in Section 5.11 and Appendix F.
101	Table 5.25 provides the accident consequences for this beyond design basis earthquake. The analysis was performed as part of the referenced safety documentation (Vail 2001). Reference: Vail, T.S. 2001. Central Waste Complex Interim Safety Basis. HNF-SD-WM-ISB-007 Rev. 1-E. Fluor Hanford. January 2001.
102	Groundwater monitoring is conducted according to DOE Orders, the RCRA permit, and Tri-Party Agreement (TPA) requirements for the disposal areas, and will be expanded as necessary according to agreements between DOE and regulatory agencies to support future waste management operations. The cost associated with expansion of the groundwater-monitoring network would be largely independent of the alternatives considered in the HSW EIS, and would not be an important discriminator among the potential actions under consideration.
103	Please see Response 102.

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104	Groundwater monitoring at Hanford would be addressed under milestones established by the TPA independently of this EIS. The summary has been substantially revised in this HSW EIS. The details of the cumulative impacts are presented in Section 5.14 and Appendix L. The details of the groundwater impacts are presented in Section 5.3 and Appendix G. Models were used in our analysis to determine potential future groundwater impacts. The results of past groundwater monitoring alone will not predict future results. Please see Response 102, too.
105	Please see Response 102, too. Groundwater monitoring at Hanford would be addressed under milestones established by the TPA independently of this EIS. This EIS has been revised to include additional discussion on groundwater monitoring (Section 1.3.4.6).
106	Please see Responses 102-105, too. The overall cost estimates included in Section 3.5 for each alternative group include a separate line item for expected groundwater monitoring costs.
107	This sitewide simulation capability, known as SAC (System Assessment Capability), has been designed as a stochastic capability with an option to perform deterministic simulations. SAC is a computer software tool that enables the user to model the movement of contaminants from all waste sites at Hanford through the vadose zone, groundwater, and the Columbia River, and to estimate the impact of contaminants on human health, ecology, local cultures, and economy. The results of initial runs of the model, including some 1,500 of the 2,100 identified sites, are provided in Section 5.14 of this HSW EIS. The SAC model has been through some verification and validation analysis in a process called "history matching" and continues to be developed and tested.
108	The infiltration rate used in this HSW EIS approximates the long-term effect of cover use on waste release as it compares to a no cover scenario examined under the No Action Alternative. This revised draft HSW EIS provides additional information about the effect of the lower design infiltration rate of the modified RCRA Subtitle C cover system on waste release and considers the effect of cover degradation after the cover design life of 500 years. The models used for the LLBG disposal authorization did not assume the use of a cover. The no-cover infiltration rate used for the disposal authorization is the same as the one used in the no-cover No Action Alternative. This infiltration rate is also assumed for the period of time after the cover system is totally degraded under the action alternatives.

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	The points of analyses used in this comparative assessment were located along lines approximately 1 km (0.6 mi) down gradient from aggregate HSW disposal areas within the 200 East, 200 West, and the ERDF areas and near the Columbia River located down gradient from all disposal site areas (Figure G.1). All locations were selected based on simulated transport results of unit releases at selected HSW disposal site locations. Points of analysis approximately 1 km down gradient from the overall waste disposal facilities in each area are not meant to represent points of compliance but rather common locations to facilitate comparison of impacts from broad waste management selections and locations defined for each alternative HSW disposal sites are not contiguous units and therefore do not lend themselves to the "100-m compliance" estimates that are more reasonably done on a trench-by-trench basis. A more detailed, highly resolved analyses of local-scale facilities similar to analyses by Wood et al. (1995 and 1996) performed for post-1988 LLW and Mann et al. (2001) performed for the ILAW disposal facility would be required.
109	See Response 108 regarding consistency between EIS analysis and disposal authorization. Although the original performance assessments (PAs) (Wood et al. 1995, 1996) and subsequent PA summaries (Wood 2003) differ in scale, the HSW EIS analysis in fact cites Wood's work and uses many of the same key assumptions and modeling input parameters as they relate to • and soil-debris release models) • - Tc-99 – ~3240 Ci - I-129 – ~5 Ci • - Tc-99 – 1 x 10-11 cm^2/s - I-129 – 1 x 10-12 cm^2/s • - 64 mg/l (non-cemented wastes) - 0.23 mg/l (cemented wastes) The principal differences relate to • conventional trench on the dose impacts at 100 m. The analysis do a comparative

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analysis of the aggregate dose impact of HSW EIS disposal sites using several alternatives of trench design, configuration, and location outside of the aggregate HSW EIS disposal site boundaries.

- sectional flow and transport at a trench scale to examine dose impacts at the 100-m scale. The HSW EIS uses a one-dimensional model of the vadose zone flow and transport to evaluate dose impacts outside of the HSW disposal areas. As a result, the latter approach does not examine local-scale spreading below a trench or disposal facility in the vadose zone.

- model than used in this analysis but both models used have similar hydraulic characteristics with updates sitewide groundwater model. The former analysis focuses on groundwater impacts at 100 m. The latter examines dose impacts at selected points of analysis down-gradient of aggregate HSW disposal areas.

In addition, the results for the ILAW disposal in the HSW EIS assessment relied on the ILAW PA as summarized by Mann et al. (2001).

Groundwater impacts from Low-Level Waste Management Areas (WMAs) 1, 2, 3, and 4 are discussed in Sections 2.8 and 2.9 in *Hanford Site Groundwater Monitoring for Fiscal Year 2001* (Hartman et al. 2002), which addresses the eight LLBGs in question. Based on results of fence line monitoring of the WMAs, the current interpretation is that there is no evidence that the specific WMAs in question have contributed to contaminants found in groundwater underlying these areas. See Section 5.3.3.1 of this HSW EIS.

110 Groundwater monitoring is conducted according to DOE Orders, the RCRA permit, and TPA requirements for the disposal areas, and will be expanded as necessary according to agreements between DOE and regulatory agencies to support future waste management operations.

The cost associated with expansion of the groundwater-monitoring network would be largely independent of the alternatives considered in the HSW EIS, and would not be an important discriminator among the potential actions under consideration.

111 For issues regarding consistency and other related questions, see also Responses 108-110.

Additional reasonable alternatives have been evaluated (see Section 3 for description of the action alternatives and Section 5 for the evaluation of the action alternatives). Additional information on mitigation measures has been provided in Section 5.18.

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	A discussion of the impacts for the disposal facilities evaluated in this HSW EIS relative to the cumulative impacts from all Hanford sources on groundwater has been included to the extent currently possible in Section 5.14 and Appendix L.
112	See Response 110 regarding groundwater monitoring requirements.
113	See Response 110.
114	Release models deal with how the contaminant gets out of the waste form and how fast. Source-release models were selected and used to approximate contaminant releases from the variety of LLW types considered in this analysis. The models considered included a soil-debris release model and a cement release model. The appropriate release models are described in detail in Appendix G.
115	The text has been revised. There are some instances where unsealed boreholes have provided a preferential path in the vicinity of liquid discharge facilities where saturated flow conditions exist. However, old unsealed boreholes are not expected to provide a pathway for contaminant migration under unsaturated flow conditions that would be expected to exist beneath solid waste disposal facilities.
116	This possibility is acknowledged in Section 4.5.1.4. Details regarding groundwater and surface water contaminants are documented in the Hanford Site Environmental Report 2001 (Poston et al. 2002).
117	Figure 4.16 has been revised to show the wells north and east of the Columbia River. Water levels are measured annually in a small set of wells north and east of the Columbia River. Every 5 years, water levels are measured in a larger set of wells. Thus, the contours are based on a combination of new data, historical data, and other factors such as topography. The networks are listed in Water-Level Monitoring Plan for the Hanford Groundwater Monitoring Project (PNNL-13021). Detailed discussion of the subsurface modeling and assumptions is provided in Section 5.3.2. Additional details regarding unconfined and confined aquifers are in the "Three-Dimensional Analysis of Future Groundwater Flow Conditions and Contaminant Plume Transport in the Hanford Site Unconfined Aquifer System: FY 1996 and 1997 Status Report" (Cole et al. 1997), Hanford Site Groundwater Monitoring for Fiscal Year 2000 (Hartman et al. 2000), Consultation Draft: Site Characterization Plan, Reference Repository Location, Hanford Site, Washington (DOE 1988), and Fresh-Water Potentiometric Map and Inferred Flow Direction of Groundwater Within the Mabton Interbed, Hanford Site, Washington State - January 1987 (Spane 1987).

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118	Additional detail, as supported by the data, has been added to the map.
119	All chromium is assumed to be hexavalent.
120	Additional information on this topic is as follows:

On the north side of the 200 East Area in the Gable Mountain-Gable Butte Gap is evidence appears of erosional channels that may allow communication between the unconfined and the uppermost basalt-confined aquifer (Graham et al. 1984; Jensen 1987). Evidence that hydraulic intercommunication occurs in the Gable Mountain-Gable Butte Gap area, where erosional windows have been identified, includes:

- chemical composition of groundwater indicating mixing
- presence in the uppermost confined aquifer of chemical species (i.e., nitrate ion) and radioisotopes (e.g., tritium and I-129) that are associated with near-surface waste water disposal
- similarity of hydraulic heads in the unconfined and uppermost confined aquifers in the vicinity of the Gable Mountain -Gable Butte Gap where the Elephant Mountain basalt is absent
- geologic information from borehole logs and geophysical information indicating an area where the Elephant Mountain basalt (confining layer) is absent, and within this area, locations where the underlying Rattlesnake Ridge interbed (water-bearing unit) and portions of the Pomona basalt (confining layer) are absent.

The area where the Elephant Mountain basalt is absent represents an area where increased aquifer intercommunication occurs, unimpeded by a confining layer. Another area where increased leakage may occur is in the vicinity of fault zones. Springs are present in the Rattlesnake Hills along the western boundary of the SGM domain that bring groundwater from the basalt-confined aquifer system to the surface. These springs are found where major thrust faults intersect the ground surface (DOE 1988). This provides evidence that the major thrust faults provide conduits for flow between aquifer systems. Anticlines may also be areas of increased communication because of fracturing. However, there is no direct evidence of intercommunication associated with anticlines other than in the area where erosional windows are also present.

Elsewhere on the Hanford Site, the Elephant Mountain basalt provides a significant impediment to vertical intercommunication between the aquifers owing to its thickness and low vertical hydraulic conductivity, which may range from 1E-8 m/d (3.3E-8 ft/d) (Graham et al. 1984) to 2.6E-4 m/d (8.5E-4 ft/d) (Nevulis et al. 1987). The effectiveness of the Elephant Mountain basalt as a confining layer and impediment to vertical

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	communication between the unconfined and uppermost confined aquifers is evidenced by the hydraulic head difference between the two aquifers and difference in groundwater chemistry. However, the rate of pervasive flow through the confining unit may still be significant because it takes place over a large area. These details do not change the assessment documented in the HSW EIS.
121	See Response 39. The occurrence of current managed and unplanned discharges are not expected after site closure and will not be important to the future potential release of contaminants for HSW disposal facilities. However, the text has been revised to add discussion of leaking raw water distribution lines.
122	See Response 120.
123	The LLBGs contain over 100 radioactive and non-radioactive constituents that potentially could impact groundwater. Screening of these constituents considered a number of aspects that included 1) their potential for dose or risk, 2) their decay or degradation rates, 3) their estimated inventories, and 4) their relative mobility in the subsurface system within a 10,000-year period of analysis. Establishing the relative mobility of each contaminant, they were grouped based on their mobility in the vadose zone and underlying unconfined aquifer. Contaminant groupings were used, rather than the individual mobility of each contaminant, primarily because of the uncertainty involved in determining the mobility of individual constituents. The waste constituents were grouped according to estimated or assumed Kd of each constituent. Based on an assumed infiltration rate and estimated levels of sorption and associated retardation, the estimated travel times of a number of constituents through the thick vadose zone to the unconfined aquifer beneath the LLBGs were calculated well beyond the 10,000-year analysis. Thus, these constituents were eliminated from further consideration. Of the remaining constituents, technetium-99, iodine-129, carbon-14, and uranium isotopes were considered of sufficient quantity and mobile enough to warrant detailed analysis of groundwater impacts. Selenium and chlorine, while mobile, were screened out because their total inventories were less than 0.01 Ci. Tritium was not evaluated because of its relatively short half-life. With some exceptions, estimated inventories of hazardous chemical constituents associated with LLW and MLLW disposed of after 1988 being considered under each alternative were expected to be found at trace levels. In particular, MLLW, which would be expected to contain the majority of hazardous chemical constituents, would undergo pre-disposal treatment to meet current HSSWAC and LDRs before being disposed of in permitted MLLW facilities. Consequently, groundwater quality impacts from these constituents would not be considered significant. Analysis of MLLW inventories for this assessment did identify two exceptions that included lead and mercury inventories

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associated with the projected MLLW that were estimated at 336 kg (741 lb) and 2.5 kg (5.5 lb), respectively. Because of its affinity to be sorbed into Hanford Sediments, lead falls within the Kd Group 5 (Kd = 40 mL/g) and would not release to groundwater within the 10,000-year period of interest in this analysis. The inventory estimated for mercury is assumed to be small enough that it would not release to groundwater in substantial concentrations. Even the most conservative estimates of release would yield estimated groundwater concentrations at levels of two orders of magnitude below the current standard of 0.002 mg/L.

LLW disposed prior to September 1987 may contain significant hazardous chemical inventories but no specific requirements existed to account for or to report of the content of hazardous chemical constituents in this category of LLW. As a consequence, analysis of these constituents and estimated impacts based on the limited amount of information on estimated inventories and waste disposal location would be subject to large uncertainty. These facilities are part of LLW and MLLW facilities in LLW management areas 1, 2, 3, and 4 that are currently being monitored under RCRA Interim Status programs. Final evaluation of these facilities under RCRA and/or CERCLA guidelines will eventually require analysis of the impacts of the chemical components of these disposed inventories. Any analysis with information that is currently available would be at best speculative without more detailed inventory characterization information. These analysis would require a more thorough and detailed characterization of these wastes at some future date.

From a risk standpoint, an initial assessment using the newly developed Sysytem Assessment Capability (Bryce et al. 2002) concluded that the two most significant hazardous chemical constituents impacting groundwater now and in the future include chromium and carbon tetrachloride. The key sources of these constituents are from waste sources other than LLBGs. Neither of these constituents are suspected to be in LLBGs in large quantities.

Elevated levels of chromium are found in some of the operating areas within the 100 Areas, especially in 100-H area. With regard to carbon tetrachloride, DOE has been conducting an expedited response action to treat carbon tetrachloride contamination originating from liquid discharge sites in 200 West area that received large quantities of carbon tetrachloride. Since 1992, soil-vapor extraction has been used to remove carbon tetrachloride from the vadose zone as part of this expedited response action (Rohay 1999; Hartman et al. 2001) at the 200-ZP-2 Operable Unit, located in the 200 West Area, with the concurrence of the EPA and the Washington State Department of Ecology (Ecology). To track the effectiveness of the remediation effort, measurement of soil-vapor concentrations of chlorinated hydrocarbons are made at the inlet to the soil-vapor-extraction system and at individual off-line wells and probes through the soil-vapor extract sites. As of September 1999, 76,500 kg (168,683 lb) of carbon tetrachloride had been removed from the groundwater and vadose zone beneath the 200 West Area. The soil-vapor concentrations monitored deep within the vadose zone during the past few years

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	suggest that soil vapor-extraction remediation has removed much of the carbon tetrachloride from the vadose zone (Hartman et al. 2001).
124	The vadose zone was modeled as a stratified one-dimensional column because of the large number of solid waste disposal facilities that needed evaluation. A one-dimensional approach would be expected to yield results that would be more conservative than those produced with multi-dimensional approaches which consider lateral spreading of infiltration and contaminant transport. The effect of features suspected to be preferential pathways in the vadose zone, such as clastic dikes, has been the subject of past and ongoing modeling and field research studies. To date, there have no definitive research or field studies that have established these features as preferential pathways for flow and contaminant transport. There are some instances where unsealed boreholes have provided a preferential path in the vicinity of liquid discharge facilities where saturated flow conditions exist. However, old unsealed boreholes are not expected to provide a pathway for contaminant migration under unsaturated flow conditions that would be expected to exist beneath solid waste disposal facilities.
125	This information is provided as additional information to the reader about the average travel time from source zones to the underlying water. The overall analysis considers the total arrival of plume from a unit release by considering both the processes of advection and dispersion in vadose zone contaminant transport and not just the 50 percent arrival time of unit mass as implied by the comment.
126	The updated analysis provides additional information about the maximum and cumulative flux of key constituents from HSW disposal facilities to the Columbia River over the 10,000-yr period of analysis. A deterministic simulation using the SAC for technetium-99 and uranium is also provided to illustrate the impact of HSW disposal facilities relative to all other waste sources at the Hanford. The cumulative effect of all constituents considered is incorporated into the health impacts in Section 5.11 and Appendix F, which include figures that show dose over the 10,000-year time period of analysis.
127	Although, the 218-W-5 Expansion Area of 202 hectares was included as a contingency for unforeseen operational needs, its use is not foreseen at this point. However the ecological and cultural resource surveys were made on the area to ascertain, what, if any problems might occur if it were to be used. If we were to determine that use of this area was needed, additional evaluation would be done.

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128	Burial Ground 218-W-6 is part of the LLBG. It has never been used for waste disposal. In this revised draft HSW EIS there is one alternative in which it would be used (see Table 5.1).
129	The section referenced should have been Section 4.3.3 in the first draft HSW EIS. Section 4 and Appendix E have been modified in the revised draft HSW EIS.
130	Additional information on air quality modeling assumptions is provided in Appendix E of this revised HSW EIS.
131	Groundwater monitoring is conducted according to the RCRA permit and TPA requirements for the disposal areas, and will be expanded as necessary according to agreements between DOE and regulatory agencies to support future waste management operations. DOE routinely monitors external radiation levels and radionuclides in soil within the LLBGs. The data referred to in this HSW EIS were obtained from sampling in the trenches under the near field-monitoring program, which would detect other radionuclides. The Hanford environmental monitoring program is discussed in Section 4 of this HSW EIS.
132	The scope of this HSW EIS changed, but was not reduced as a result of the WM PEIS decisions. The HSW EIS is intended to evaluate the proposed actions and the consequences of various alternatives for consistent with the WM PEIS decisions at Hanford. A discussion of the WM PEIS and its relationship to the HSW EIS can be found in Section 1.5. The WM PEIS was a comprehensive evaluation of DOE nationwide waste management, and DOE determined there was sufficient information to make decisions regarding the sites that were suitable for long-term waste management missions. The WM PEIS was widely distributed, and documents cited in the WM PEIS were made available at numerous libraries and reading rooms in Washington and Oregon. Likewise, documents cited in this HSW EIS are available in public reading rooms listed in published notices and this document. *The Technical Report on Affected Environment for the Sites Considered n the DOE Waste Management Programmatic Environmental Impact Statement* (M/B SR-01) supports the WM PEIS; requests for copies of the document should be referred to Ms. Carol M. Borgstrom, Director, U.S. Department of Energy, Office of NEPA Policy and Assistance, EH-42, 100 Independence Avenue S.W., Washington D.C. 20585

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133	The RADTRAN model and codes have been well documented and verified and the details are included by reference in this HSW EIS. Documentation for the model is available in public reading rooms, as listed in public notices and in this EIS, and also is available upon request from the HSW EIS Document Manager. Inclusion of the air emission equations was considered to be more appropriate, because they are relatively straightforward.
134	The Prototype Barrier Treatability Test Report (DOE/RL-99-11, 200-BP-1, p. 4-1) indicates the following regarding a 0.15-m Asphaltic Concrete Coated with Fluid-Applied Asphalt: Essentially no drainage of water through the barrier silt-loam layers was observed under ambient and extreme (3 times normal precipitation including 1,000-year storms) precipitation conditions. The upper silt-loam layers and capillary barrier functioned to effectively store precipitation for subsequent removal by evapotranspiration, thereby preventing drainage. As expected, drainage did occur for the gravel and riprap side slopes, but was effectively diverted by the sloped asphalt layer. No change in water content or drainage was observed under the asphalt layer except at its very edge.
135	Available data on contaminant migration beneath existing trenches are limited. Models were used in our analysis to determine potential future groundwater impacts, because the results of past groundwater monitoring alone will not predict future results. Information on infiltration can be found in Section 5.3 and Appendix G.
136	The revised draft HHSW EIS analysis does evaluate the potential impacts of these earlier disposals by evaluating the effect of higher infiltration rates during operations. Results of analyses of earlier disposal facilities using release and vadose zone infiltration rates of 5 cm/yr, a rate reflective of managed bare surface soil conditions over the older disposal areas during the operations phase, estimated arrival of mobile contaminants (such as technetium-99 and iodine-129) at immediate down-gradient locations several hundred years before impacts of later disposals were realized. Peak concentrations of technetium-99 and iodine-129 were estimated to arrive at down-gradient locations between years 2050 and 2100 from 200 East Area locations and year 2300 and 2350 from 200 West Area locations. These results are considered to be a bounding analysis of impacts for the following reasons: • release and would be leached at rates reflective of this assumed high rate of infiltration. In reality, the actual leaching of wastes would be expected to be much lower. • be much higher than would be expected. This high rate of infiltration applied in the

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	vicinity of waste trenches would be expected to decline to rates more reflective of natural recharge as it encounters soils in their natural dry state below the waste trenches and migrates downward and laterally in the vadose zone in the surrounding areas. Descriptions of the underlying assumptions and resulting estimated impacts (that is, contaminant concentration levels and peak arrival times) from these analyses are provided in detail in Appendix G of this HSW EIS.
137	Retrieval of TRU waste from the LLBGs has already started. Shipment of TRU waste to WIPP has also started. Over one third of the TRU waste in the LLBGs is scheduled to be retrieved by 2006 (Hanford Performance Management Plan [HPMP] DOE 2002). Retrieval will be completed before the end of the operational period. No substantial releases are expected to occur before the waste is retrieved. Please see Response 136.
138	DOE would agree with the commenter that sorption characteristics of certain contaminants inferred from observations beneath tank farms can be variable when influenced by the combination of extreme chemical characteristics of tank wastes suspected to have leaked into the vadose zone and the characteristics of soils found in these areas. The leak volume, extreme pH conditions, and high salt content in wastes originating from tanks alleged to have leaked within the S-SX Tank Farm are suspected to be contributing factors in observed transport of certain constituents like cesium-137. With regard to cobalt, the commenter refers to a cobalt-60 plume that has been observed in the northern part of 200 East Area near the in the B-BX-BY waste management area. The occurrence of this plume is suspected to have originated from a liquid discharge facility that received wastes containing complexing agents (EDTA and/or ferro-ferric-cyanide). However, the combination of geochemical conditions and the occurrence of liquid discharges in both of these cases are unique to the waste site impacts in question and cannot be interpreted as being representative of expected geochemical or vadose zone flow and transport conditions that would be expected at solid waste burial grounds. LLBGs have only received what would be considered dry solid wastes with very low liquid contents. LLBGs have not received tank wastes nor any other types of liquid wastes with such extreme chemical characteristics as cited above. There is no evidence that the extreme geochemical conditions suspected to exist beneath some past tank leaks or near some liquid discharge sites persist beneath LLBGs. Distribution coefficients selected for use in the EIS for the constituents in question were based on geochemical conditions that would be reflective of solid waste disposal environment that can be characterized as having a low organic content, near neutral pH conditions, and low salt content.

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139	The basis for this statement is found in the main conclusions on groundwater impacts from Low-Level Waste Management Areas (WMAs) 1, 2, 3, and 4 in Sections 2.8 and 2.9 in *Hanford Site Groundwater Monitoring for Fiscal Year 2001* (Hartman et al. 2002), which addresses the eight LLBGs in question. Based on results of fence line monitoring of the WMAs, the current interpretation is that there is no evidence that the specific WMAs in question have contributed to contaminants found in groundwater underlying these areas. See Section 5.3.3.1 of this HSW EIS.
140	Solid waste placed into the LLBGs may have contained all of the contaminants identified in Section 5.3 of this HSW EIS. However, these constituents in groundwater are thought to only have originated from other past practice disposal actions outside of the LLBGs. Based on results of fence line monitoring of the WMAs, the current interpretation is that there is no evidence that the specific WMAs in question have contributed to contaminants found in groundwater underlying these areas. See Section 5.3.3.1 of this HSW EIS.
141	The summary has been substantially revised in response to comments and consistent with CEQ regulations (40 CFR 1502.12). The summary presents the major conclusions, areas of controversy, including issues raised by the public, and highlights of the analyses of the EIS. Subject matter references have been added where they are considered helpful to the general reader.
142	The summary has been extensively revised in the revised draft HSW EIS. Subject matter references have been added where they are considered helpful to the general reader.
143	A figure of the Hanford land-use plan was included in the main text of the HSW EIS and has been added to the summary.
144	The figure has been revised.
145	The text has been revised.
146	The text has been revised.
147	The HSW EIS uses both Safe Drinking Water Act maximum contaminant levels (MCLs) and DOE derived concentration guides (DCGs) for its evaluations. These respective values were developed to meet different public health protection functions. MCLS were developed for the protection of public drinking water supplies. DCGs were developed to demonstrate compliance with DOE's dose limits to the public. Additional information about the relationship between MCLs and DCGs is in Section 4.5.3.2 of the first draft HSW EIS.
148	Please see Response 123.

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149	The recommended changes have been incorporated with a slight modification to the second recommendation (for lines 27-28), which now states: "The EPA issued portion of the RCRA permit covered the Hazardous and Solid Waste Amendments, Section 3004(u), portion of the RCRA permit."
150	Updated costs are now included in Tables 3.6 and 3.7 in Section 3.5.
151	The vadose zone was modeled as a stratified one-dimensional column. In this analysis, it was not appropriate to represent the vadose zone as multidimensional because of the large number of LLBG sites modeled and the limited characterization of the vadose zone. Multidimensional modeling of the vadose zone has been performed for some waste sources and types (Mann et al. 1997; DOE/ORP 2001) but was not practical for this analysis for the large number of sites in question. A one-dimensional approach will yield more conservative results than a multi-dimensional approach.
152	This comment raises the same issue as Comment 100; please see Response 100.
153	This comment raises the same issue as Comment 101; please see Response 101.
154	This comment raises the same issue as Comment 117; please see Response 117.
155	Alternatives have been added. The Hanford Only waste volume has been added to address the "limited range of waste volumes."
156	The WM PEIS was a comprehensive evaluation of DOE nationwide waste management, and DOE determined there was sufficient information to make decisions regarding the sites that were suitable for long-term waste management missions. The WM PEIS was widely distributed, and documents cited in the WM PEIS were made available at numerous libraries and reading rooms in Washington and Oregon. Likewise, documents cited in this HSW EIS are available in public reading rooms listed in published notices and this document.
157	The scope of this HSW EIS has been revised to evaluate disposal of the immobilized low-activity waste generated by the Hanford Waste Treatment Plant. Other past buried wastes at Hanford are addressed as part of the cumulative impact analysis.
158	Disposal of waste in lined mega-trenches and use of the ERDF have been added as alternatives.
159	Wastes disposed of in the LLBGs since they opened in 1962 are evaluated in this HSW EIS. Wastes disposed of prior to 1962 are addressed as part of the cumulative impacts (see Sections 5.14 and Appendix L). Uncertainties about hazardous chemical constituents

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	in the previously disposed of waste are discussed in Section 3.0. This waste will ultimately go through a CERCLA or RCRA past practice remedial action process prior to closure of the LLBGs.
160	Evaluations of an Upper Bound TRU waste volume that includes TRU waste from offsite sources have been added.
161	This HSW EIS has been revised to include analysis of the disposal of the immobilized low-activity waste.
162	The "no import of out of state waste" scenario is evaluated as a result of evaluating the Hanford Only waste volume that has been added to this HSW EIS. We analyzed an Upper Bound volume that represents the maximum potential volume of waste that we reasonably expect could be brought to Hanford based on current conservative projections. We do not envision more than that amount being brought to Hanford in the future. Further environmental review would be required if that situation were to change. The waste volumes analyzed in the WM PEIS reflect the total volumes anticipated for disposal at Hanford Site and the Nevada Test Site. Neither site would be expected to receive the total the waste volume.
163/164	DOE acknowledges the State's comments concerning the potential acceptance of out-of-state waste, however DOE is not aware of an "inconsistency of a proposed action with any approved State or local plan and laws…" (40 CFR 1506.2[d]). Additional discussion of mitigation measures has been added to Section 5.18 in this HSW EIS.
165/166	This HSW EIS considers post-closure institutional controls (see Section 2.0) and costs (see Section 3.5) in its analysis beyond 2046. The radionuclides evaluated for groundwater transport are all generally very long-lived. With the exception of carbon-14 with a half-life of 5730 years, the half-lives are greater than 150,000 years. Thus, radioactive decay is negligible over the 10,000 years evaluation period. Ten half-lives is the general rule of thumb to calculate when radioactivity will approach zero. Figures showing key radionculide concentrations in groundwater over time for the 10,000-year period have been added to Section 5.3.

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167	Additional discussion of limitations, uncertainties, and assumptions has been provided throughout this revised HSW EIS.
168	The text has been revised throughout the EIS to provide additional information about characteristics of disposed waste (e.g., Section 2.0, Appendix F, etc.) and groundwater movement (e.g., Sections 4.0, 5.3, etc.) to support conclusions.
169	See responses to related comments on this subject (e.g., Response 63 to the comment regarding the Great Basin pocket mouse). Please also see Response 67, regarding the restoration of priority habitat.
170	A discussion of uncertainties has been added to Section 3.0 of this HSW EIS.
171	The evaluation of cumulative impacts has been substantially expanded (see Section 5.14 and Appendix L in Volumes I and II of this EIS).
172	For all waste alternatives analyzed in this HSW EIS, DOE has analyzed the movement of contaminants through groundwater to the Columbia River. In all cases, it found that the water quality of the Columbia River would be indistinguishable from the current river background levels. The concentrations of all constituent contaminants were well below benchmark maximum contaminant levels at a hypothetical well located near the Columbia River. The "analysis of impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason" (40 CFR 1502.22 [c]). The health impacts on downstream populations of groundwater reaching the Columbia River are discussed in Section 5.11 and Appendix F. The ecological impacts are discussed in Section 5.5 and Appendix I. The impacts of groundwater reaching the river are discussed in Section 5.3 and Appendix G. Additional discussion of uncertainties has been added to Section 3.0. Additional discussion of mitigation measures appears in Section 5.18. For purposes of conservatism the No Action Alternative assumes that caps would not be placed on the LLBGs, although DOE intends to cap them.
173	DOE is committed to cleanup of the Hanford Site through the TPA process. DOE does not believe that any offsite DOE wastes shipped to Hanford will be problematic, will complicate future remediations, or will divert resources or disposal capacity from other Hanford cleanup activities. The HSW EIS has been prepared in accordance with NEPA and the CEQ and DOE implementing regulations.

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174	In Section 6 of this HSW EIS, we identify the regulatory requirements followed in conducting operations at Hanford Site, including RCRA and State Dangerous Waste Regulations under the Hazardous Waste Management Act (Section 6.3). Section 6.19 addresses permits required to construct and operate treatment, storage, and disposal facilities related to the alternatives. Whenever we discuss facilities involved with treatment and storage and disposal of mixed waste, it is our intent to comply with all applicable requirements. Please see Response 81 regarding consultation requirements under the Endangered Species Act. For all waste alternatives analyzed in this HSW EIS, DOE has analyzed the movement of contaminants through groundwater to the Columbia River. In all cases, it found that the water quality of the Columbia River would be indistinguishable from the current river background levels. The concentrations of all constituent contaminants were well below benchmark maximum contaminant levels at a hypothetical well located near the Columbia River. The "analysis of impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason" (40 CFR 1502.22 [c]).
175	This HWS EIS includes a revised purpose and need statement that was developed in consultation with EPA and Ecology staff. The revised EIS also includes the analysis of additional alternatives and encompasses indirect effects of the alternatives. Additional discussions of the affected environment and the environmental impacts are included in Sections 4 and 5, respectively. Additional information on cumulative impacts is provided in Section 5.14 and Appendix L. Irreversible and irretrievable commitment of resources is discussed in Section 5.15. Impacts to long-term productivity are included in Section 5.16. DOE is not aware of an "inconsistency of a proposed action with any approved State or local plan and laws…" (40 CFR 1506.2[d]).
176	Please see Response 89 regarding the "Point of Compliance." Existing groundwater monitoring data do not indicate that releases from LLBGs have occurred. The analysis in this HSW EIS evaluates potential long-term groundwater impacts that might occur as a result of contaminant migration from the LLBGs. The text has been revised throughout this EIS to provide additional information about characteristics of disposed waste (e.g., Section 2.0, Appendix F, etc.) and groundwater movement (e.g., Sections 4.0, 5.3, etc.).

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177	Groundwater monitoring is conducted according to DOE Orders, the RCRA permit, and TPA requirements for the disposal areas, and will be expanded as needed according to agreements between DOE and regulatory agencies to support future waste management operations. The cost associated with expansion of the groundwater-monitoring network would be largely independent of the alternatives considered in this HSW EIS, and would not be an important discriminator among the potential actions under consideration.
178	Please see Responses 63-81, which address the issues summarized in this comment.
179	Please see Response 81.
180	Additional information has been included in the revised draft HSW EIS. See Section 4.0 for the species list that has been updated based on information from the State of Washington Department of Fish and Wildlife (WDFW). See Section 5.5 and Appendix I for discussion of ecological assessment/impact issues.
181	In the revised draft HSW EIS both Appendix F (Methods for Evaluating Impacts on Health and from Radionuclides and Chemicals) and Section 5.11 (Human Health and Safety Impacts) have been revised. The revisions address some of the concerns raised in the comment, including a substantially increased discussion of the concept of resident gardener. Please also see Response 93.
182	Please see Responses 85 and 86 regarding exposure scenarios, methodologies used for measuring health impacts, and concerns about sensitive populations. DOE is not aware of any incorrect assumptions "regarding the grouted vs. non-grouted Tc-99." The estimates of the Tc-99 inventories in un-grouted and grouted wastes is reflective of current estimates of solid wastes forecasts for the Hanford Site.
183	With respect to modeling input, the transport and deposition of material released to the atmosphere were evaluated using the atmospheric transport component of MEPAS Version 4.0. This component implements the models from earlier versions of MEPAS as described by Droppo and Buck (1996). The models are similar to and consistent with the models recommended by EPA in the Industrial Source Complex dispersion model (EPA 1995). Also, the atmospheric dispersion models in the MEPAS program provide nearly identical results to those generated using the EPA CAP88 program, as verified in a benchmarking study performed on the MEPAS, MMSOILS, and RESRAD computer programs (Mills et al. 1997). The RESRAD program employed the CAP88 program for atmospheric transport calculations (Cheng et al. 1995). Radiological dose conversion factors (DCFs) for intrusion, both well drilling and basement excavation scenarios, were taken from Low Level Burial Ground Performance

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	Assessments (e.g., WHC-SD-WM-TI-730, Performance Assessment for the Disposal of Low-Level Waste in the 200 East Area Burial Grounds). These DCFs were multiplied by maximum concentrations reported in waste streams. Maximum concentrations were derived from the Solid Waste Information Tracking System (SWITS) database. Section 5.11 and Appendix F have been substantially revised in this revised draft HSW EIS. Appendix F includes an example input and output from the MEPAS program (Droppo et al. 1996, EPA 1995, Mills et al. 1997, Cheng et al. 1995).
184	Hanford Site groundwater and vadose zone models have been incorporated into a sitewide model as part of the Groundwater/Vadose Zone Integration Project (DOE-RL 1999a, b; DOE-RL 2000). This sitewide simulation capability, known as SAC, has been designed as a stochastic capability with an option to perform deterministic simulations. It uses the groundwater model of the Hanford Site produced and supported by the Groundwater Monitoring Program. Currently, the groundwater portion of this model implements a three-dimensional conceptual model of the unconfined aquifer. This model has been inverse calibrated to Hanford Site water table measurements from 1944 to present, and uses knowledge of geohydrologic units and field measurements of hydraulic conductivity to condition the model calibration. Future revisions of the SAC will incorporate inverse calibrated alternate conceptual models of the aquifer. However, at present, uncertainty in groundwater contaminant migration and fate is represented by the uncertainty in contaminant mobility as reflected in uncertainties in linear sorption isotherm model parameters (for example, distribution coefficients for various contaminants). At the time of preparation the first draft HSW EIS cumulative impacts evaluation used the best information available from the Groundwater/Vadose Zone Integration Project (DOE-RL 1999a, b; DOE-RL 2000) and from the Hanford Site Composite Analysis (Kincaid et al. 1998). The HSW EIS provides a conservative analysis commensurate with the purpose of the document, which is to bound and compare the consequences of the alternatives. However, initial runs of the SAC code using information for about 1500 of the 2100 waste sites at Hanford are summarized in the Cumulative Impacts Section of this revised draft HSW EIS. A discussion of uncertainties has been added to Section 3.0 of this HSW EIS.
185	Cost estimates are for life-cycle activities and are in constant 2001 dollars. No costs are discounted. Details of the cost estimates are contained in Appendix C of the Technical Information Document (FH 2002). Costs include post-closure activities, such as monitoring during the institutional control period. Discussion of post-closure institutional controls (see Section 2.0) and costs (see Section 3.5) beyond 2046 has been added to this HSW EIS.
186	The discussion of transportation has been added in Section 2.2.4, Section 5.8, and

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	Appendix H in Volumes I and II of this HSW EIS. The impacts of transporting waste to and from Hanford through the states of Oregon and Washington are included.
	The use of rail is not part of the proposed action evaluated in this HSW EIS. Shipments of waste by rail may require constructing a spur from the existing rail lines, which, if proposed, would require additional NEPA review.
187	This HSW EIS has been substantially revised to address comments. Revisions include, but are not limited to, the addition of an evaluation of a Hanford Only waste volume to determine the impacts of not receiving offsite waste at Hanford, and the addition of cumulative impact information in Section 5.15 and Appendix L. An effort has been made to make reference documents more readily available.

188 Although the original performance assessments (PAs) (Wood et al. 1995, 1996) and subsequent PA summaries (Wood 2003) differ in scale, the HSW EIS analysis in fact cites Wood's work and uses many of the same key assumptions and modeling input parameters as they relate to

- and soil-debris release models)

- - Tc-99 – ~3240 Ci
  - I-129 – ~5 Ci

- - Tc-99 – 1 x 10-11 cm^2/s
  - I-129 – 1 x 10-12 cm^2/s

- - 64 mg/l (non-cemented wastes)
  - 0.23 mg/l (cemented wastes)

The principal differences relate to

- conventional trench on the dose impacts at 100 m. The analysis do a comparative analysis of the aggregate dose impact of HSW EIS disposal sites using several alternatives of trench design, configuration, and location outside of the aggregate HSW EIS disposal site boundaries.

- sectional flow and transport at a trench scale to examine dose impacts at the 100-m

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	scale. The HSW EIS uses a one-dimensional model of the vadose zone flow and transport to evaluate dose impacts outside of the HSW disposal areas. As a result, the latter approach does not examine local-scale spreading below a trench or disposal facility in the vadose zone.
	• model than used in this analysis but both models used have similar hydraulic characteristics with updates sitewide groundwater model. The former analysis focuses on groundwater impacts at 100 m. The latter examines dose impacts at selected points of analysis down-gradient of aggregate HSW disposal areas.
189	Please see Response 137.
190	The modeling did consider potential releases from the waste during the operational period. Appendix G has been revised to more clearly reflect this.
191	Please see Response 89 regarding the "Point of Compliance."
192/193	This HSW EIS includes summaries of the major components of the proposed action regulatory framework in Section 6. Detailed evaluation of other environmental regulatory programs and their requirements is more appropriately addressed in the documentation prepared for those programs. Information about CERCLA and RCRA corrective action is addressed in detail in environmental documentation that has been or will be prepared pursuant to the conduct of TPA activities.
194	This HSW EIS considers post-closure institutional controls (see Section 2.0) and costs (see Section 3.5) in its analysis beyond 2046.
195	The HSW EIS alternatives incorporate elements of some initiatives considered as part of the Performance Management Plan for the Accelerated Cleanup of the Hanford Site (HPMP, DOE/RL 2002). In some cases, detailed evaluation of proposals may be deferred to future NEPA documents because they are not ready for decision at this time.
196	The HSW EIS has been revised in response to general and specific comments. It is being circulated as a revised draft HSW EIS.
197	DOE notes the comment. The General Summary was most helpful to us in responding to the individual comments from Ecology.

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198	This HSW EIS has a revised purpose and need based on stakeholder comments. Other major revisions are the inclusion of the immobilized low-activity waste product from the waste treatment program, evaluations of new and reconfigured alternatives, and additional information about the alternatives and their impacts.
199	This HSW EIS has been revised to evaluate a Hanford Only waste volume so that the incremental impacts of the receipt of offsite waste can be ascertained. The major benefit of importing offsite wastes to Hanford is that it may enable other generator sites that do not have the capability to treat these wastes, to be cleaned up sooner, thereby freeing up resources that can then be employed to accelerate cleanup at Hanford.
200	Additional alternatives for the disposal of waste in deeper lined trenches have been added to this HSW EIS.
201	DOE has developed and analyzed the costs for each alternative considered in this HSW EIS. The scope of the cleanup activity is expected to include maintenance of the leachate collection system, monitoring of the cap performance, and maintenance of passive administrative controls (signs/postings). Groundwater monitoring is conducted according to DOE Orders, the RCRA permit, and TPA requirements for the disposal areas, and will be expanded as necessary according to agreements between DOE and regulatory agencies to support future waste management operations. DOE is committed to meeting environmental regulations and standards now and in the future. EPA and Ecology (under CERCLA and RCRA) require monitoring, reporting, and record keeping. Thus, there is a legal requirement that DOE, or its successor entities, meet these requirements.
202	Please see Response 156.
203	This HSW EIS has been revised to evaluate a Hanford Only waste volume.
204	Please see Response 158.
205	Please see Response 167.
206	Please see Response 168.
207	Please see Response 168.
208	Please see Response 171.

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209	See responses to related comments on this subject (e.g., Response 63 to the comment regarding the Great Basin pocket mouse). Please also see Response 67, regarding the restoration of priority habitat.
210	DOE recognizes that the cleanup of Hanford is a complex effort and is committed to it through the TPA process. As of February 1, 2003, DOE had met 99% of its TPA milestones on or ahead of schedule.
211	This HSW EIS has been expanded to address long-term stewardship. It expands upon the range and depth of alternatives analyzed, provides information describing accelerated cleanup plans and how they affect they affect the HSW EIS. The analysis also distinguishes between Hanford Only waste volumes and those projected to originate offsite. This HSW EIS considers post-closure institutional controls (see Section 2.0) and costs (see Section 3.5) in its analysis beyond 2046.
212	Please see Response 186.
213	The HSW EIS has been revised and reissued in response to comments on the first draft HSW EIS, and to incorporate new waste management activities and alternatives that have been under consideration since the first draft was issued. Revisions include the following: • a more comprehensive discussion of Hanford waste management activities as they relate to cleanup at Hanford and other DOE sites (see Summary and Section 1). • expanded analyses for groundwater quality (Section 5.3, Appendix G), transportation (Section 5.8, Appendix H), cumulative impacts (Section 5.14), and other consequences identified as being of particular concern in public comments. • evaluation of impacts from managing Hanford generated waste separately from offsite waste to facilitate understanding the incremental consequences from offsite waste that may be received for treatment or disposal at Hanford. • additional alternatives for disposal of LLW, MLLW, ILAW, and WTP melters in either independent or combined-use facilities. • evaluation of some new waste management activities proposed as a result of the C3T process and plans to accelerate Hanford cleanup, such as the Hanford Performance Management Plan issued in August 2002, to the extent possible. In some cases, those proposals would need to be evaluated during future NEPA reviews because they are not ripe for decision at this time.

3.2.2 Oregon State Department of Energy

Oregon

John A. Kitzhaber, M.D., Governor

OREGON OFFICE OF ENERGY

625 Marion St. NE, Suite 1
Salem, OR 97301-3742
Phone: (503) 378-4040
Toll Free: 1-800-221-8035
FAX: (503) 373-7806
www.energy.state.or.us

August 15, 2002

Mr. Michael S. Collins
HSW EIS Document Manager
Richland Operations Office
U.S. Department of Energy, A6-38
P.O. Box 550
Richland, WA 99352-0550

Re: Draft Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement, Richland, Washington (DOE/EIS-0286D), April 2002

Dear Mr. Collins:

The Oregon Office of Energy appreciates the opportunity to review and comment on the Draft Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement (Draft HSW EIS).

1 The Oregon Office of Energy highly values transparency in all clean-up and disposal decision-making at the Hanford Site. We also highly value seeking involvement from all those in the region who may be affected by such clean-up and disposal decisions. Simply put, transparency and broad involvement help insure sound decision-making.

2 The May 15, 2002 letter to citizens accompanying the Draft HSW EIS describes the document as a "decision supporting document, not a decision making document...to ensure the decision maker is able to consider the environmental impacts of a proposed major Federal action." The Oregon Office of Energy's extensive review indicates that the Draft HSW EIS is incomplete and contains insufficient detail to fulfill that stated purpose. The document is inadequate to support the thorough analysis of alternatives and environmental, health and safety effects required by the National Environmental Policy Act (NEPA).

Consequently, we urge the U.S. Department of Energy to withdraw the document, revise it to include the information and analyses identified in the following summary comments, and reissue a revised draft for public review and comment.

SUMMARY

3 The Council on Environmental Quality (CEQ) NEPA implementing regulations, 40 CFR § 1502.12, require the summary of an environmental impact statement (EIS) to adequately and accurately summarize the EIS, including the major conclusions and areas of controversy. The summary for the Draft HSW EIS is incomplete without a discussion of the Waste Management Programmatic Environmental Impact Statement (DOE/EIS-0200), which supported the decision to dispose low-level and mixed low-level waste at the Hanford Site and the Nevada Test Site. Explanations of that document and decision are essential to understanding the proposed action.

4 The decision to send low-level and mixed low-level waste to the Hanford Site is what the CEQ regulations describe as a "connected action."[1] The CEQ regulations require connected actions to be considered together to prevent agencies from minimizing potential environmental consequences by segmenting actions. 40 CFR § 1508.25(a)(1).
5 The summary should explain how the Draft HSW EIS relates to the decision to send low-level and mixed-low waste to the Hanford Site. It should specifically list site specific information and analysis deferred by the Waste Management Programmatic EIS for inclusion in the Draft HSW EIS.

STATEMENT OF PURPOSE AND NEED

6 The Statement of Purpose and Need conflicts with the statement in the May 15, 2002 letter to citizens that the Draft HSW EIS is a decision supporting document. The Statement of Purpose and Need states that "DOE needs to enhance and expand…and *to make decisions* that will enable[.]" (Draft HWS EIS at S.2, emphasis added.) The revised Draft HSW EIS should specify whether the need is to support a decision or make a decision.

7 Further, the proposed action will not occur in a void, but in a place where there is already extensive soil and groundwater contamination. It will occur in the midst of an enormous, complex environmental cleanup. For example, the Draft HSW EIS does not account for the pre-1970 transuranic waste that is buried at the Hanford Site. Also, the River Protection Project is seriously considering additional methods of treating Hanford's tank wastes that will create materials that likely will be disposed of in trenches on-site. The Draft HSW EIS fails to account for such activities.

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4 (contd)

40 CFR § 1508.25(a)(1) provides:

"1. Connected actions, which means that they are closely related and therefore should be discussed in the same impact statement. Actions are connected if they:
(i) Automatically trigger other actions which may require environmental impact statements.
(ii) Cannot or will not proceed unless other actions are taken previously or simultaneously.
(iii) Are interdependent parts of a larger action and depend on the larger action for their justification."

The decision to send low-level and mixed low-level waste to the Hanford Site is a connected action under (i). The proposed action in this Draft HSW EIS is a connected action under (iii).

8 We are particularly disturbed that the Draft HSW EIS perpetuates the piecemeal approach to analyzing waste handling, treatment and disposal impacts that the Oregon Office of Energy identified as a problem in its February 1996 comments (1996 Waste Management PEIS Comments) on the Draft Waste Management Programmatic Environmental Impact Statement For Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste (DOE/EIS-0200-D), August 1995.[2] In those comments, we identified at least two other environmental impact statements describing proposed actions that could leave large quantities of waste in place at the Hanford Site. We noted that contamination plumes from those wastes would have impacts across the Hanford Site for tens of thousands of years. We urged that "[t]he EIS should comprehensively examine the cumulative action of all existing, planned or considered federal actions at each site." (See 1996 Waste Management PEIS Comments at 2.) Unfortunately, the U.S. Department of Energy never responded to those comments and the problem of piecemeal analysis persists in this Draft HSW EIS.

9 Accordingly, the Statement of Purpose and Need should be revised to specify that the proposed action must occur in conformance with ongoing waste management, treatment, disposal and clean-up activities at the Hanford Site. Those activities and their corresponding risks and regulatory requirements constrain the proposed action. The failure to include information about the interrelationship between the proposed action and ongoing Hanford clean-up activities in the Statement of Purpose and Need causes incomplete analyses throughout the Draft HSW EIS.

ALTERNATIVES

10 The alternatives section is the heart of an EIS. It should rigorously explore and objectively evaluate all reasonable alternatives and explain why alternatives were eliminated from consideration. It should present the environmental impacts of the proposal in comparative form to define the issues and provide a clear basis for choosing among the alternatives. There should be sufficient comparative detail to allow reviewers to evaluate the merits of the alternatives. Finally, the CEQ NEPA regulations specifically require the alternatives section to include appropriate mitigation measures not already included in the proposed action or alternatives. 40 CFR § 1502.14(f).

12 The Oregon Office of Energy's review indicates that the alternatives section of the Draft HSW EIS is seriously flawed. First, there is no true no-action alternative.[3] Second, there is no consideration of a range of alternatives. Third, there is insufficient detail about the alternatives to evaluate them individually or compare them to one another. Finally, none of the alternatives includes any mitigation measures.

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[2] We enclose a copy of those comments as a courtesy for ease of reference.
[3] We note that the no-action alternative for disposal of low-level waste listed in the Draft HSW EIS, burial without a cap, is invalid, because it would violate the regulatory requirements for shallow land burial of radioactive waste. Class C wastes must be disposed of a minimum of 5 meters below the surface of the cover or be disposed of with barriers that protect against inadvertent intrusion for at least 500 years. 10 CFR § 61.52(a)(2).

The Oregon Office of Energy believes that a true no-action alternative would be a
12 combination of treatment and disposal methods at the originating sites that eliminate the
need for shipping waste to the Hanford Site. The alternatives for low-level and mixed
low-level waste described in the Draft HSW EIS focus on varying levels of pretreatment
13 and disposal at Hanford. A reasonable range of alternatives should include different
methods of treatment to change the wastes into forms that do not release hazardous or
radioactive constituents into the vadose zone and groundwater. The alternatives should
include a range of locations and trench sizes at the Hanford Site. Most importantly, the
alternatives should discuss in detail a range of different trench designs, including liners,
leachate collection and treatment systems, gas collection and treatment systems, and
14 cover and cap designs. The alternatives should also include detailed information on the
performance standards for these structures, systems for monitoring their performance,
measures to mitigate any adverse environmental impacts and institutional controls. All of
this information should be discussed and placed in context with ongoing Hanford clean-
up activities.

The Draft HSW EIS contains essentially no information about the design of the disposal
15 trenches or how the U.S. Department of Energy will assure performance. Without such
information, it is impossible to meaningfully compare the alternatives or assess their
impacts.

Environmental Consequences

The environmental consequences section of an EIS forms the scientific and analytic basis
for comparing the alternatives for a proposed action. The CEQ NEPA regulations require
this section of an EIS to include unavoidable adverse impacts (direct, indirect and
cumulative) as well as means to mitigate them and irreversible or irretrievable resource
16 commitments. 40 CFR § 1502.16.

The Oregon Office of Energy's review indicates that the information and analysis
deficiencies described above continue into this section of the Draft HSW EIS. There is
insufficient detail or information about the alternatives to evaluate their environmental,
health and safety impacts. Moreover, the analysis in the Draft HSW EIS is incomplete
without factoring the past, present and future waste disposal and clean-up operations at
the Hanford Site into all the environmental consequences analyses. The failure to address
such activities means that the Draft HSW EIS minimizes the total risk presented by the
Hanford Site. It presents incomplete analysis of only the incremental risk increase of the
17 proposed action. Instead, the revised Draft HSW EIS should present a comprehensive
analysis of the Hanford Site's risks that includes and identifies the increased risks caused
by the proposed action. Finally, several of the impacts discussed in the Draft HSW EIS
have questionable scientific or analytic bases.

The revised Draft HSW EIS should specify the form of the wastes to be disposed and
18 their radiological activity. The form of the waste – whether and how it may be bound to
other materials – has a significant impact on its mobility in the vadose zone and

groundwater. Different waste forms will require different burial trench designs to
18 prevent or minimize environmental impacts. Because there is no information about the
form of the waste in the Draft HSW EIS, the environmental impacts of the alternatives
are uncertain.

The revised Draft HSW EIS should also specify waste acceptance criteria, performance
standards, maintenance and monitoring plans for the disposal trenches as well as
permitting requirements. The waste acceptance criteria assure that the wastes being
19 received at the Hanford Site are the types of wastes the trenches are designed to safely
dispose.[4] The performance standards should take into account existing inventory
uncertainty and current environmental effects from past disposal practices as well as the
additional impacts of the proposed action. Today, even solid waste landfills are
constructed to stringent, predefined engineering and performance standards to minimize
environmental impacts. The Draft HSW EIS does not specify trench performance
standards. Without information about such standards and plans to assure those standards
are being met and maintained, the environmental impacts of the alternatives are
unknown.

The revised Draft HSW EIS should also address the following:

<u>Burial Trench Performance Monitoring</u>

- Contaminant Detection. The U.S. Environmental Protection Agency's RCRA
Ground Water Monitoring Technical Enforcement Guidance Document (TEGD)
defines the basic goal of monitoring as detecting the first arrival of a contaminant.[5]
The point of detection monitoring well is usually geographically closer to the area
being monitored than the point of compliance monitoring well. This allows
intervention to maintain compliance if a contaminant is detected in the point of
20 detection monitoring well. However, the Hanford Site's 200 Area already contains
extensive contamination caused by buried wastes with many of the same
contaminants that would be disposed under the alternatives presented. The revised
Draft HSW EIS should describe how the monitoring system for the proposed burial
trenches will distinguish existing contamination from new contamination from wastes
in the proposed new burial trenches. The revised Draft HSW EIS should also explain
how the proposed monitoring system will be adjusted in response to declining water
table levels across the Hanford Site.

21 Monitoring Point of Compliance. The Draft HSW EIS locates points of compliance
one kilometer down gradient from the waste disposal site and adjacent to the
Columbia River. This groundwater only monitoring strategy allows potential

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[4] Moreover, we repeat our 1996 comment, "Appropriate acceptance criteria must be imposed to limit the
19 risks to the appropriate standards when considered along with the risks from all other wastes and activities
on the site." (1996 Waste Management PEIS Comments at 10.)

20 [5] See RCRA Ground Water Monitoring Technical Enforcement Guidance Document (TEGD), OSWER
Document Number 9950.1, September 1986, Chapter Two at 46.

21 degradation of the aquifer upgradient from the monitoring point. Standard scientific practice and the U.S. Environmental Protection Agency's TEGD recommend locating monitoring wells on the disposal site boundary to allow immediate detection of releases.[6] This does not preclude monitoring the vadose zone. The revised Draft HSW EIS should explain the basis for departing from that practice and why the proposed locations will assure an equivalent level of aquifer protection and early detection of releases.

Burial Trench Impacts

22
- Groundwater and Risk Models. The Draft HSW EIS contains numerical fate and transport results that predict groundwater plumes that develop differently from past releases and projections. For example, the predicted plume (Draft HSW EIS Figure G.7, at G.34 to G.37) turns to the northeast. That is perpendicular to existing flow lines and may be an artifact of transition from a fine grid discretization to a coarser grid discretization. Additionally, the groundwater and vadose zone flow numerical models assume numerous uniform isotropic conditions, which tend to homogenize impacts, and do not reflect actual conditions. Further, the contaminant fate and transport numerical model that overlies the groundwater flow numerical model uses generalized Kd values. The use of generalized Kd values is contrary to U.S. Environmental Protection Agency guidance (EPA/402-R-99-004A), which recommends using site specific contaminant values.

  The revised Draft HSW EIS should explain why the predicted plumes and impacts differ from actual site conditions and historic projections. It should explain why the models may be used to reliably predict future conditions when they do not reliably predict current conditions. Moreover, the revised Draft HSW EIS should explain whether the values used in the models are consistent with the values used in the Resource Conservation and Recovery Act Permit Models and Comprehensive Environmental Compensation and Liability Act groundwater monitoring results for the Hanford Site. If the values differ, there should be an explanation why. Finally, the revised Draft HSW EIS should explain the basis for departing from the U.S. Environmental Protection Agency's guidance regarding use of site specific Kd values.

23
- Construction Borrow Sources. The Draft HSW EIS describes only the general area where capping material would be obtained and the disturbance to that area (Draft HSW EIS at 5.22 to 5.24). The Draft HSW EIS does not provide information on the sources, volumes or types of soils required for trench construction under the various alternatives. The necessary volumes may exceed available on-site resources or there may be insufficient supplies of the necessary type of soil. Either possibility would require shipment of soils from off-site or manufacture of amended soil on-site. The impacts of either possibility should be discussed. Even if there is a sufficient on-site

[6] See TEGD at 47.

source, the revised Draft HSW EIS should explain how that source will be used
consistent with the regulatory requirements for national monuments. It should also
23 describe in detail a reclamation plan for any on-site sources.[7] This is another issue
that we raised in our 1996 Waste Management PEIS Comments that the U.S.
Department of Energy has failed to address.

- Threatened or Endangered Species. The Draft HSW EIS indicates that the U.S. Department of Energy consulted with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service, and requested a listing of federally protected species in the existing low-level burial grounds and "other areas potentially disturbed by waste management activities" in 1998. The Draft HSW EIS further indicates that the U.S. Department of Energy re-initiated those consultations, because the potential surface disturbance areas for the proposed action expanded well beyond the area considered in 1998. The Draft HSW EIS indicates that the National Marine Fisheries Service's and the U.S. Fish and Wildlife Service's responses to the most recent requests are pending. (Draft HSW EIS Section 5.5.4 at 5.24.)

The U.S. Department of Energy did not re-initiate consultations with the National
Marine Fisheries Service or the U.S. Fish and Wildlife Service until preparation of
the Draft HSW EIS was well underway. Appendix I of the Draft HSW EIS contains
letters to both agencies from Steven H. Wisness, Director of the Richland Operations
24 Office's Office of Site Services, dated March 25, 2002. (See Draft HSW EIS at I.15
to I.24.) The National Marine Fisheries Service responded by telephone on April 26,
2002 and the U.S. Fish and Wildlife Service responded with an April 23, 2002 letter
describing three threatened species and twenty-three species of concern in the area of
the proposed action. (See Draft HSW EIS at I.20-I.21.) The Draft HSW EIS is dated
April 2002.

The Draft HSW EIS indicates that species concerns were not considered until very late in the development of the proposed action. Such late consideration is contrary to CEQ's NEPA regulations, which require agencies to prepare draft environmental impact statements concurrently with and integrated with environmental impact analyses required by the federal Endangered Species Act. 40 CFR § 1502.25. The revised Draft HSW EIS should discuss in detail how the various alternatives will impact the species identified by the National Marine Fisheries Service and the U.S. Fish and Wildlife Service.

Transportation Impacts

The Draft HSW EIS relies on the Final Waste Management Programmatic Environmental
25 Impact Statement For Managing Treatment, Storage and Disposal of Radioactive and
Hazardous Waste (DOE/EIS-0200-F), May 1997, for analysis of off-site transportation

[7] As we recommended in our 1996 Waste Management PEIS Comments, the reclamation plan should
23 include replanting with native seed and plant stock. (See discussion of infrastructure impacts, 1996 Waste
Management PEIS Comments, at 2.)

25 impacts. That Waste Management Programmatic EIS analyzed transportation risks associated with the waste volumes stored and projected to be generated through 2017.[8] However, the Draft HSW EIS applies to waste volumes to be generated through 2046. Because the periods of analysis in the Waste Management Programmatic EIS and the Draft HSW EIS differ and the actual and projected waste volumes have changed significantly in the five years since the Waste Management Programmatic EIS was completed, it is inappropriate to rely on that document for analysis of off-site transportation impacts. The revised Draft HSW EIS should include a new analysis of such impacts using the most up to date waste volumes (current and projected). The analysis should extend through 2046.

Moreover, as we urged in our 1996 Waste Management PEIS Comments (at 7-9), we strongly suggest that the transportation impacts analysis include the following:

26 1 A route specific analysis – rather than a generic analysis – which identifies and considers the specific geographic and weather-related conditions for the portions of the transportation routes through Oregon to the Hanford Site.

27 2. The potential for impacts to the Confederated Tribes of the Umatilla Indian Reservation.

28 3. The use of dedicated or special trains to haul waste, rather than limiting the analysis strictly to the use of general freight for waste shipped by rail.

MITIGATION

29 The CEQ NEPA regulations require the environmental consequences section of an EIS to discuss means to mitigate environmental impacts if not discussed in the alternatives section of an EIS. 40 CFR § 1502.16(h). The regulations further define mitigation as avoiding the impacts altogether, minimizing the impacts, rectifying the impacts by repairing, rehabilitating or restoring the affected environment, reducing the impact or compensating for the impact. 40 CFR § 1508.20(a)-(e).

As noted previously, the Draft HSW EIS does not discuss mitigation in the alternatives section. Section 5.18 (Draft HSW EIS at 5.112 to 5.114) describes potential mitigation measures for the impacts identified. This section is wholly inadequate and fails to meet NEPA's requirements. The fundamental problem with this section is no mitigation measures are specified and performance of mitigation is contingent upon U.S. Department of Energy discretion.

For example, the introduction to Section 5.18 provides: "This section contains a description of mitigation measures that *might be considered* to avoid or reduce

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25 [8]Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage and Disposal of Radioactive and Hazardous Waste (DOE/EIS-0200-F), May 1997, Appendix E, Section E.2.3 at E-11.

29 environmental impacts made as a result of Hanford Site operations in support of solid waste management." (Draft HSW EIS at 5.112, emphasis added). The same paragraph states that after preparation of the Record of Decision, "a mitigation plan *would be prepared if warranted"* to address action specific to the alternative selected for implementation. "That plan *would be implemented as necessary to mitigate significant adverse impacts* of solid waste management activities." In essence, the Draft HSW EIS states that the U.S. Department of Energy will develop a mitigation plan if it decides one is necessary.

30 A description of specific measures to mitigate the identified impacts is essential to comparing the environmental impacts of the alternatives and choosing a preferred alternative. Postponing a detailed analysis and plan for mitigation until just prior to initiating operations (see Draft HSW EIS Section 5.18.3 at 5.112) defeats the whole purpose of the NEPA process. That process requires assessment of such measures at the go-no go stage of planning a project, not when a project is underway. The mitigation measures must be developed and analyzed during the early stages of planning, because they may influence or alter the alternative selected.

31 In addition, implementation of mitigation measures should not be left up to U.S. Department of Energy discretion. If the impacts are so uncertain that the U.S. Department of Energy cannot specify measures to mitigate them or whether it will implement any such measures, then the impacts of the proposed action are too uncertain to proceed. In that event, the U.S. Department of Energy should postpone the proposed action until it can characterize the impacts with sufficient certainty to specify mitigation measures.

In short, the revised Draft HSW EIS should describe specific measures that the U.S. Department of Energy will implement to mitigate the impacts identified in Section 5.0 of the Draft HSW EIS. The Oregon Office of Energy recommends that the U.S. Department of Energy develop those mitigation measures in consultation with the Hanford Natural Resources Trustee Council.

Again, the Oregon Office of Energy appreciates the opportunity to comment on the Draft HSW EIS. We look forward to receiving the U.S. Department of Energy's direct, written responses to these comments. If you have questions, please contact me at 503-378-4906.

Sincerely,

Ken Niles
Administrator, Nuclear Safety Division

Letter: L103

Oregon

John A. Kitzhaber, M.D., Governor

OREGON OFFICE OF ENERGY

625 Marion St. NE, Suite 1
Salem, OR 97301-3742
Phone: (503) 378-4040
Toll Free: 1-800-221-8035
FAX: (503) 373-7806
www.energy.state.or.us

August 15, 2002

Mr. Keith Klein
Manager, Richland Operations Office
PO Box 550
Richland, WA 99352

Dear Keith:

201 Enclosed with this letter are the comments of the Oregon Office of Energy on the draft Hanford Solid Waste Program Environmental Impact Statement (Solid Waste EIS). Our review has found many deficiencies in the draft Solid Waste EIS and our comments reflect our concern about the adequacy of this document. We believe that the draft Solid Waste EIS is so inadequate that USDOE should begin again and issue a revised draft for public review that adequately addresses the issues raised in our comments.

202 In addition to other deficiencies. the draft Solid Waste EIS raises questions about the adequacy of treatment and disposal plans both for existing solid waste already at Hanford and the massive amounts of additional waste which would be sent to Hanford. 203 In prior programmatic and Hanford site-specific environmental impact statements we have opposed proposals by USDOE to send large amounts of new waste to Hanford and we have filed comments which expressed in great detail the reasons for our opposition. None of those concerns were addressed in prior environmental impact statements nor have they been addressed in the current draft Solid Waste EIS. 204 Our concerns about the impacts of shipping such large amounts of waste through Oregon have also not been addressed.

205 I am also concerned that the inadequacy of the draft Solid Waste EIS undermines the important work to accelerate Hanford cleanup through the Cleanup Constraints and Challenges Team (C3T). Oregon continues to support the C3T effort and the commitments made by USDOE in the latest draft of the Performance Management Plan for the Accelerated Cleanup of the Hanford Site. However, the draft Solid Waste EIS raises a number of questions about the ability of USDOE to meet those commitments. For example, the large amount of new solid waste which would be stored and disposed at the Hanford site may divert efforts from the actions needed to implement the Accelerated Cleanup Plan.

August 15, 2002
Page 2

206 I regret that our comments are not more positive. However, I encourage you to reissue a draft environmental impact statement for public review which remedies these shortcomings. Please contact me at (503) 378-5489 or Ken Niles at (503) 378-4906 if you have any questions or would like to discuss this further.

Sincerely,

Mike

Michael W. Grainey
Director

Cc: Mr. Tom Fitzsimmons, Director, Washington Department of Ecology
Mr. Mike Gearheard, U. S. Environmental Protection Agency
Stuart Harris, Confederated Tribes of the Umatilla Indian Reservation
Russell Jim, Yakama Indian Nation
Patrick Sobotta, Nez Perce Tribe
Oregon Hanford Waste Board
Todd Martin, Hanford Advisory Board
Oregon Congressional Delegation

Mwg/hanford/2002/solidwasteeisltr.doc

Responses to Letter L103

Comments	Responses
1	We agree. The U.S Department of Energy (DOE) solicited input from regulators, Tribal Nations, and members of the public over a three-month time period on the draft *Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement* (HWS EIS). The input received made it clear that DOE needed to provide more information and better explain the entirety of the waste management program at Hanford, including how it fits into the larger picture of waste management across the DOE complex. DOE has revised the HSW EIS to address comments received in writing and at public meetings. For the revised draft HSW EIS, we are following a similar procedure, including a 45-day public comment period and public meetings. Information has been sent to anyone who requested information, attended a public meeting, or submitted comments on the first draft.
2	The draft HSW EIS has been revised and reissued to provide another opportunity for public comment. The EIS has been prepared in compliance with DOE and Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) requirements.
3	The summary of this HSW EIS has been revised to present a brief overview of the major conclusions and areas of controversy for the HSW EIS. Additional discussion of the Waste Management Programmatic (WM PEIS) and its resulting decisions is in Section 1.5 of this HSW EIS.
4 - 5	The relationship of site-specific NEPA documents and the decisions made by the Records of Decision issued pursuant to the WM PEIS are summarized in Chapter I, Introduction and Background, of the PEIS, as follows: "DOE will use the analyses presented in the PEIS to decide on a programmatic or strategic approach to managing its waste. DOE intends to select a configuration of DOE sites for waste management activities on the basis of the WM PEIS and other factors. The level of analysis in the WM PEIS is appropriate for making broad programmatic decisions on what DOE sites should be used for waste management. At the programmatic level, however, it is not possible to take into account special requirements for particular waste streams, different technologies that are or may be available to manage particular wastes, or site-specific environmental considerations such as the presence of culturally important resources or endangered species at a specific location on a site. DOE will rely upon other NEPA reviews, primarily ones that evaluate particular locations on sites or projects (sitewide or project-level reviews), for these analyses. Thus, decisions regarding specific locations for waste management facilities at DOE sites or the waste management technologies to be used will be made on the basis of sitewide or project-level NEPA reviews."

Responses to Letter L103

Comments	Responses
6	This HSW EIS provides important environmental information to assist DOE in making decisions about site-specific storage, treatment, and disposal actions at Hanford. This EIS includes a revised purpose and need statement that was developed in consultation with U.S. Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology) staff (see Section 1.2).
7	The System Assessment Capability (SAC) has been used to provide additional cumulative impact information, which includes pre-1970 waste (see Section 5.14 and Appendix L). This HSW EIS has been revised to include the disposal of the ILAW stream from the high-level waste treatment program. The Environmental Impact Statement for Retrieval, Treatment, and Disposal of Tank Waste and Closure of Single-Shell Tanks at the Hanford Site (68 FR 1052) will analyze other tank waste activities.
8	This HSW EIS complies with the letter and intent of applicable CEQ NEPA requirements. See Response 4.
9	An EIS must briefly specify the purpose and need to which the agency is responding in proposing the alternatives, including the proposed action (40 CFR 1502.13). This HSW EIS includes a revised purpose and need statement that was developed in consultation with U.S. Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology) staff (see Section 1.2).
10	Sections 3 and 5 have been substantially revised to evaluate additional alternatives, including those with additional mitigation components.
11	A No Action Alternative under NEPA does not necessarily mean no action at all (see CEQ Forty Most Asked Questions, Question 3, No Action Alternative [46 FR 18026]). Pursuant to the HSW EIS Notice of Intent (65 FR 10061), under the no action alternative, "DOE would continue ongoing waste management activities and implement those actions for which NEPA reviews have been completed and decisions made [the baseline for analytical purposes would be the time of issuance of the first draft HSW EIS]. The no action alternative will provide a baseline for comparison of the environmental impacts of the proposed action and its alternatives." Discussion of a "stop action" scenario has been added in Section 3 and in Appendix O. This HSW EIS includes additional alternatives for disposal of LLW, MLLW, ILAW, and WTP melters in either independent or combined-use facilities that comply with RCRA and state standards for disposal of hazardous wastes. A number of locations for the disposal facilities are considered, including the ERDF (see Section 3.). Many of the alternative disposal facility configurations would include liners, leachate collection

Responses to Letter L103

Comments	Responses
	systems, and regulatory-compliant covers installed at or before closure (see Section 3.). Mitigation measures are discussed in Section 5., and measures such as greater confinement of higher-activity LLW and MLLW are incorporated into the HSW EIS alternatives. All of the action alternatives discussed in this EIS comply with applicable DOE radioactive waste management requirements (e.g., DOE 435.1 [DOE 2001]). The 10 CFR 61 regulations are applicable to commercial facilities, not DOE facilities.
12	A No Action Alternative under NEPA does not necessarily mean no action at all (see CEQ Forty Most Asked Questions, Question 3, No Action Alternative [46 FR 18026]). Pursuant to the HSW EIS Notice of Intent (65 FR 10061), under the no action alternative, "DOE would continue ongoing waste management activities and implement those actions for which NEPA reviews have been completed and decisions made [the baseline for analytical purposes would be the time of issuance of the first draft HSW EIS]. The no action alternative will provide a baseline for comparison of the environmental impacts of the proposed action and its alternatives." Discussion of a "stop action" scenario has been added in Section 3. and in Appendix O. The revised draft HSW EIS also evaluates various forecast waste quantities that include only Hanford generated waste, in addition to varying amounts of offsite waste. The inclusion of a Hanford Only volume provides an evaluation of a scenario in which no offsite waste would be received.
13	Treatment technologies for hazardous constituents in MLLW are largely specified by RCRA and state regulations. The specific technologies assumed for the HSW EIS consequences analysis are intended to minimize the potential operational and long-term impacts. This EIS also assumes certain categories of waste are placed in high-integrity containers or in-trench grouted to minimize the potential operational and long-term impacts.
14	A broader range of locations and trench sizes, some of which include liners and leachate collection, are evaluated in this HSW EIS. This HSW EIS includes additional alternatives for disposal of LLW, MLLW, ILAW, and WTP melters in either independent or combined-use facilities that comply with RCRA and state standards for disposal of hazardous wastes. A number of locations for the disposal facilities are considered, including the ERDF (see Section 3.). Many of the alternative disposal facility configurations would include liners, leachate collection systems, and regulatory-compliant covers installed at or before closure (see Section 3.). Mitigation measures are discussed in Section 5., and measures such as greater confinement of higher-activity LLW and MLLW are incorporated into the HSW EIS alternatives.

Responses to Letter L103

Comments	Responses
15	This HSW EIS includes additional alternatives for disposal of LLW, MLLW, ILAW, and WTP melters in either independent or combined-use facilities that comply with RCRA and state standards for disposal of hazardous wastes. A number of locations for the disposal facilities are considered, including the ERDF (see Section 3.). Many of the alternative disposal facility configurations would include liners, leachate collection systems, and regulatory-compliant covers installed at or before closure (see Section 3.). Mitigation measures are discussed in Section 5., and measures such as greater confinement of higher-activity LLW and MLLW are incorporated into the HSW EIS alternatives. Additional information on performance assessments has been provided in Appendix G. Active institutional controls, including maintenance and surveillance, will be performed after trenches are closed.
16	This HSW EIS has been revised to evaluate disposal of an additional waste stream, to provide evaluations of additional alternatives, and to provide additional information in response to comments.
17	The SAC has been used to provide additional cumulative impact information on the Hanford Site (see Section 5.14 and Appendix L). This HSW EIS addresses increased risks associated with the proposed action and alternatives. Sections 3 and 5 and their associated appendixes provide additional information and a comparative analysis of potential impacts among the alternatives. DOE has used the best available data and appropriate analytical methods in assessing environmental consequences.
18	Appendix G discusses waste forms, release models, and how they were applied in modeling groundwater transport. Uncertainties associated with the impact analyses are addressed in Section 3.
19	The HSSWAC are addressed in Section 2 of this HSW EIS. The full set of criteria is referenced and available. As required by DOE 435.1, the HSSWAC would be revised as needed, based on periodic performance assessment updates prepared during operations, to ensure that long-term impacts would not exceed established dose standards. An environmental monitoring program, including groundwater and air sampling, will confirm facility performance and compliance with dose standards (Wood 1990). The HSSWAC also incorporate requirements for greater confinement of higher-activity LLW and MLLW through disposal in high-integrity containers, or by grouting the waste in place in the disposal facility. All waste would have to meet HSSWAC. Mixed wastes would also have to be treated to meet LDRs prior to disposal. Most of the disposal alternatives include lined trenches that would meet the substantive requirements of RCRA and the Washington Dangerous

Responses to Letter L103

Comments	Responses
	Waste Regulations. The cumulative impacts analysis includes potential impacts from past, present, and reasonably foreseeable disposal practices (see Section 5.14 and Appendix L).
20	Groundwater monitoring is conducted as part of an integrated program according to DOE Orders, the RCRA permit, and TPA requirements for the disposal areas, and will be expanded as necessary according to agreements between DOE and regulatory agencies to support future waste management operations.
21	The hypothetical wells used for groundwater quality analysis in the HSW EIS are not intended to be locations for the point-of-compliance monitoring wells that may be constructed in the future. The locations were chosen as points of analysis only to assess the impacts of all waste disposal sites on groundwater quality. Groundwater monitoring would be expanded as necessary according to agreements between DOE and regulatory agencies to support future waste management operations. A discussion concerning a possible enhanced system of monitoring wells has been added to Section 5.18 in response to comments. Location of new waste disposal in already contaminated areas makes detection of contamination from specific sources more difficult. However, the alternative is to dispose of waste in uncontaminated areas.
22	Given the expected long delay of contaminants reaching the water from the LLBGs, the hydrologic framework of all groundwater transport calculations was based on postulated post-Hanford steady-state water table as estimated with the three-dimensional model. These conditions would only reflect estimated boundary condition fluxes (for example, natural recharge and lateral boundary fluxes) and not the effect of past and current wastewater discharges on the unconfined aquifer system that are seen in current conditions. The current version of the sitewide model relies on a three-dimensional representation of the aquifer system that was calibrated to Hanford sitewide groundwater monitoring data collected during Hanford operations from 1943 to the present. The calibration procedure and results for this model are described in Cole et al. (2001a). This recent work is part of a broader effort to develop and implement a stochastic uncertainty estimation methodology in future assessments and analyses using the sitewide groundwater model (Cole et al. 2001b). The resulting distribution of hydraulic conductivities from this recent calibration effort is provided in Figures G.11 and G.12 in Appendix G of this HSW-EIS. DOE believes that modeling procedures and values used are consistent with those applied in the RCRA and CERCLA context at Hanford.

Responses to Letter L103

Comments	Responses
	The assessment benefits from preceding analyses and field observations, including the performance assessments for 200 West and 200 East post-1988 burial grounds (Wood et al. 1995, 1996), the remedial investigation and feasibility study of the ERDF (DOE 1994b), the disposal of ILAW originating from the single- and double-shell tanks (Mann et al. 1997) and (DOE/ORP 2001), and the Composite Analysis of the 200 Area Plateau (Kincaid et al. 1998). These and other analyses, (for example, environmental impact statements) included development of inventory data and application of screening or significance criteria to identify the radionuclides that could be expected to significantly contribute to either the dose or risk calculated in the respective analysis. Clearly, those radionuclides identified as potentially significant in these published analyses are also expected to be key radionuclides in this assessment.
23	The amount of capping material needed is addressed in Section 5.10. In response to the concern that the Area C borrow pit is in the National Monument, this is a common but incorrect assumption. Area C is not in the National Monument (65 FR 37253). In consultation with the U.S. Fish and Wildlife Service and the Washington State Department of Fish and Wildlife, Area C was designated for "conservation mining" land use in the Hanford Comprehensive Land-Use Plan EIS (DOE 1999). Area C was selected to avoid damaging an essential wildlife corridor between the Hanford Site and the Yakima Training Center.
24	In addition to the NEPA-required consultation for this EIS, DOE is a co-manager with the FWS for the Hanford Reach National Monument. DOE meets with various levels of FWS management on an ongoing and regular basis to discuss common issues. This provides an added opportunity for consultations outside of the NEPA process. The March 2002 consultation request letters were intended to update the previous consultations prior to release of the draft HSW EIS. This HSW EIS addresses biological and ecological resources in Section 4.6 and in Appendix I. Estimated impacts on ecological resources are summarized in Section 5.5. DOE believes that the consultations with the NMFS and FWS have been timely and used in the appropriate context in this EIS.
25	The impacts of transporting waste to and from Hanford through the states of Oregon and Washington are included in Section 2.2.4, Section 5.8, and Appendix H in Volumes I and II of this HSW EIS.
26	The impacts of transporting waste to and from Hanford through the states of Oregon and Washington are included in Section 2.2.4, Section 5.8, and Appendix H in Volumes I and II of this HSW EIS. This discussion now includes information on transportation routes through Oregon. RADTRAN uses route-specific accident statistics that account for geography, weather, driver error, traffic load, and road conditions.

Responses to Letter L103

Comments	Responses
27	The potential impacts to all people along Oregon transportation routes are included in this HSW EIS.
28	The U.S. Department of Transportation study (DOT 1998) compared dedicated and regular freight service using factors that measure impacts to overall public safety. The results of this study indicated that dedicated trains could provide advantages over regular trains for incident-free transportation but could be less advantageous for accident risks. However, available information does not indicate a clear advantage for the use of either dedicated trains or general freight service. Even though the DOT study was for HLW and spent nuclear fuel the conclusions are expected to be applicable to other waste types as well.
29-31	Additional information on potential mitigation measures is included in Section 5.18 of this HSW EIS. The alternatives section has been expanded to include additional alternatives that incorporate specific mitigation features, including caps and liners. Trust organizations are intimately involved in Hanford site mitigation measures. The Department of Energy, Richland Operations (DOE-RL) has established an Office of Site Services (OSS), which takes the lead in defining Hanford's ecosystem management approach to biological resource management. A DOE-RL Natural Resources Working Group (NRWG) was established to assist OSS to provide assistance and oversight support to DOE-RL programs/contractors by providing ecological input and information to accomplish a sound clean up effort. Members of the Hanford Natural Resources Trustee Council include the Department of Interior, Native American tribes, and the states of Washington and Oregon, among others.

Note: (Numbering is not sequential; however, all comments and responses are included).

201	The draft HSW EIS has been revised and reissued to provide another opportunity for public comment. The EIS has been prepared in compliance with DOE and CEQ NEPA requirements
202	The draft HSW EIS has been revised and reissued to provide another opportunity for public comment. The EIS has been prepared in compliance with DOE and CEQ NEPA requirements.
203	This HSW EIS evaluates various forecast waste quantities that include only Hanford generated waste, in addition to varying amounts of offsite waste. The inclusion of a Hanford Only volume provides an evaluation of a scenario in which no offsite waste would be received. These offsite wastes are factored into the cumulative impact analysis addressed in Section 5.14 and Appendix L.

Responses to Letter L103

Comments	Responses
204	The impacts of transporting waste to and from Hanford through the states of Oregon and Washington are included in Section 2.2.4, Section 5.8, and Appendix H in Volumes I and II of this HSW EIS.
205	The draft HSW EIS has been revised and reissued to provide another opportunity for public comment. The EIS has been prepared in compliance with DOE and CEQ NEPA requirements. The C3T dialogue and Hanford Performance Management Plan (PMP) were completed after the release of the first draft HSW EIS. At the time the first draft of the HSW EIS was published (April 2002) the details of the accelerated cleanup schedule were not sufficiently developed to permit incorporating them into the analysis for the first draft HSW EIS. The revised draft HSW EIS evaluates new alternatives developed in response to public comments and to accommodate some accelerated cleanup proposals that have been under consideration in the period since the draft HSW EIS was published (e.g., co-disposal of LLW and MLW in a lined, mega-trench). DOE remains committed to the C3T process.
206	The draft HSW EIS has been revised and reissued to provide another opportunity for public comment. The EIS has been prepared in compliance with DOE and CEQ NEPA requirements.

Letter: L096

3.2.3 Washington State Fish and Wildlife Service

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State of Washington
DEPARTMENT OF FISH AND WILDLIFE

Mailing Address: 600 Capitol Way N • Olympia, WA 98501-1091 • (360) 902-2200, TDD (360) 902-2207
Main Office Location: Natural Resources Building • 1111 Washington Street SE • Olympia, WA

August 20, 2002

Mr. Keith A. Klein, Manager
Department of Energy
Richland Operations Office
Post Office Box 550
Richland, Washington 99352

Dear Mr. Klein:

SUBJECT: DRAFT HANFORD SITE SOLID (RADIOACTIVE AND HAZARDOUS) WASTE PROGRAM ENVIRONMENTAL IMPACT STATEMENT (EIS)

1 The Washington Department of Fish and Wildlife (WDFW) has completed review of the Draft Solid Waste EIS. The WDFW is providing comments on this EIS because of our responsibility to protect, preserve, perpetuate, and manage fish and wildlife resources in Washington State. The WDFW has significant fish and wildlife trustee resources associated with the Hanford site, and we are co-trustees with the Department of Ecology on the Hanford Trustee Council. Our comments are focused on the species potentially impacted by the proposed actions and the reluctance of Department of Energy's (DOE) commitment to fully mitigate for these actions.

2 Overall, the Draft EIS fails to adequately evaluate the impacts of proposed actions on state and federally listed species. The state has 18 listed species that are associated with shrub steppe habitat that are not evaluated within this document. This document devalues the importance of The Nature Conservancy's (TNC) ongoing biological inventory on the Hanford site. "From a conservation standpoint, the Hanford Site is a vital and perhaps the single most important link in preserving and sustaining the diverse plants and animals of the Columbia Basin Ecoregion" (TNC 1998). The 1999 TNC report indicated 28 rare plant taxa were located on the Hanford site, including three species that are new to science. Twenty species of butterflies and moths were new to science, and 14 species represent new state records for Washington. The bird inventories documented 221 species on the Hanford site including 22 not previously known.

3 Regarding the threatened and endangered species information presented on page 4.64, paragraph two, the following statement is incorrect, "no plants or mammals on the Federal list of threatened and endangered wildlife and plants are known to occur on the Hanford site," Table 4.11 should include the following species:

Mr. Keith A. Klein
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3

Loggerhead shrike	SS/FSC
Sage Grouse	ST/FC
Washington Ground Squirrel	SS/FC
Burrowing Owl	SS/FSC
Pygmy Rabbit	SE/FE
Northern Goshawk	SC/FSC
Common Loon	SS
Sagebrush Lizard	FSC
Olive-sided Flycatcher	FSC
Willow Flycatcher	FSC

State Sensitive (SS), State Threatened (ST), State Endangered (SE), Federal Species of Concern (FSC), Federal Candidate (FC), Federal Endangered (FE),

The statement "the common loon is the only Washington State sensitive animal species found on the Hanford site," is also incorrect given the updated information, as shown above.

4 Table 4.12, Washington State Candidate (SC) species should include:

Lewis Woodpecker	SC
Vaux's Swift	SC

5 This Draft EIS fails to recognize the importance of the microbiotic crust to the shrub steppe ecosystem by excluding it in the limited analysis of project impacts to the environment. As stated in the TNC report, "it clearly plays an important role in ecosystem functioning by reducing erosion, contributing nitrogen and organic carbon to the soil, and increasing infiltration of precipitation into the soil. Intact crusts can also enhance native seedling establishment in arid ecosystems" (TNC 1999).

6 The Draft EIS does not include sufficient data regarding groundwater contamination and movement. Our concerns relate to the lack of information on current and potential contaminants and their impact to groundwater, which ultimately discharges to the Columbia River. Risks from carbon tetrachloride and PCB were not evaluated in this document. Within the Draft EIS it gives conflicting information on the impacts to the aquatic resources from this proposed project. The Appendix I states that potential impacts to riparian and aquatic resources would occur in the long-term (up to 10,000 years), following the conclusion of waste management operations. In

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6 another paragraph (5.5.5.), Impacts to Aquatic Ecology in the Long-term, "leaching of radionuclides and other hazardous chemicals from the waste via infiltrating precipitation would eventually result in small quantities of long-lived mobile nuclides reaching the Columbia River. There was no evidence of adverse impacts on aquatic biota for any of the alternatives". Given the limited analysis provided within the Draft EIS, there is no guarantee that aquatic receptors would not be impacted from the proposed actions. Further, impacts to federally listed steelhead are not adequately analyzed within this document.

7 The DOE should not attempt to exclude itself from potential liability by the use of the term "irreversible and irretrievable commitments of resources" by excluding ground water impacts from this process (page 5.109). As stated in two previous WDFW letters regarding I and I language, DOE should thoroughly identify the natural resources which may be injured during remediation or other activity for each project, develop a plan for a full and proper mitigation for those injuries, and then carry through with a plan.

8 The WDFW is concerned with the lack of apparent commitment from DOE for mitigation for the continued loss of shrub steppe habitat in the Low Level Burial Ground's (LLBGs) in the 200 Area West and East, due to the efforts of vegetation control (herbicide application) as indicated in Appendix I. We disagree with the following statement, "continued use of these LLBGs, or new disturbance of the extant plant communities within them, would not result in the loss of any habitats designated by Washington State as priority habitat". The WDFW mitigation policy goal is to maintain the functions and values of fish and wildlife habitat in the state, and we strive to **protect the productive capacity and opportunities reasonably expected of a site in the future.** In the long term, WDFW shall seek a net gain in productive capacity of habitat through restoration, creation and enhancement. Since shrub steppe habitat is a WDFW priority habitat, a mitigation ratio of 3:1 is recommended for the loss of shrub steppe habitat on central Hanford, as indicated in the Hanford Site Biological Resources Mitigation Strategy Plan (BRMiS), for compensatory mitigation.

9 Appendix I discusses the proposed project's expansion of a borrow site (Area C) within the Arid Lands Ecology Reserve (ALE). This area is part of the Hanford National Monument and also contains mitigation sites from DOE's operations within the 200 Area. The maps provided within the appendix (figure I.1, I.2, I.3) do not illustrate the extent of disturbance this activity would have on ALE. In addition, Appendix D mentions the blasting of basalt in Area C. The discussion of potential impacts to terrestrial resources is excluded largely within this Draft EIS. Elk impacts due to this activity are only mentioned passively within the Aesthetic and Scenic Resources section of the Draft EIS. Elk are a priority species for the WDFW, and a more thorough assessment of the impacts of blasting to elk and other species is recommended.

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The WDFW appreciates the opportunity to comment on this Draft Solid Waste EIS. If you have any specific questions regarding the comments please contact Lauri Vigue (360) 902-2425.

Sincerely,

Greg Hueckel
Assistant Director, Habitat Program

GH:LV:kam

Cc: Ted Clausing, Region 3 Habitat Program Manager
David Mudd, Major Projects Division Manager
Cynthia Pratt, SEPA Coordinator
Larry Goldstein, WDOE

References

The Nature Conservancy. 1998. Biodiversity Inventory and Analysis of the Hanford Site. Seattle, Wa.

The Nature Conservancy. 1999. Biodiversity Inventory and Analysis of the Hanford Site. Final Report: 1994-1999. Seattle, Wa.

Responses to Letter L096

Comments	Responses
1	The U.S. Department of Energy (DOE) operates the Hanford Site in accordance with the Biological Resource Management Plan (BRMaP; DOE-RL 2001) and the Biological Resource Mitigation Strategy (BRMiS; DOE-RL 2003).
2	Biological and ecological resources are discussed in Section 4.6 and in Appendix D. Estimated impacts on ecological resources are evaluated in Section 5.5 and Appendix I. The Nature Conservancy's (TNC's) efforts are cited extensively in these sections. DOE considers the biodiversity inventories conducted by TNC to be valuable resources in planning future site activities.
3	"No plants or mammals on the Federal list of threatened and endangered wildlife and plants are known to occur on the Hanford Site" is in fact a correct statement, because the pygmy rabbit is currently not known to occur on Hanford.

With respect to the species listed --

- loggerhead shrike: this species is a State Candidate (per http://www.wa.gov/wdfw/wlm/diversty/soc/candidat.htm current through June, 2002), not State Sensitive, and is already in Table 4.12.
- sage grouse: this species is already in Table 4.11, but its status was corrected from Federal species of concern to Federal candidate.
- Washington ground squirrel: this species is a State Candidate (per http://www.wa.gov/wdfw/wlm/diversty/soc/candidat.htm current through June, 2002), not State Sensitive, and is already in Table 4.12.
- burrowing owl: this species is a State Candidate (per http://www.wa.gov/wdfw/wlm/diversty/soc/candidat.htm current through June, 2002), not State Sensitive, and is already in Table 4.12.
- pygmy rabbit: this species has been reported as residing on the Fitzner/Eberhardt Arid Lands Ecology (ALE) Reserve (Fitzner and Gray 1991).
- However, this observation is based on only one reported sighting in 1979. Its presence on the Hanford Site is unlikely, and has not been documented with additional sightings or physical evidence since that time despite intensive surveys (Neitzel 2002). Thus, it is not included in Table 4.11 of species "….occurring on the Hanford Site".
- Northern goshawk: this species is already in Table 4.12.
- common loon: This statement about this species is found on page 4.64 "The common loon (Gavia immer) is the only Washington State sensitive animal species

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Comments	Responses

found on the Hanford Site." Since it is the only "sensitive" animal species, it does not fit into one of the existing tables, and is thus already covered in the text.

- sagebrush lizard: this species was added to Table 4.11 (Fitzner and Gray 1991).
- olive-sided flycatcher: this species was added to Table 4.11 (Landeen et al. 1992).
- willow flycatcher: this species was added to Table 4.11 (Landeen et al. 1992).

With respect to the common loon comment –

The common loon is still the only Washington State sensitive animal species found on the Hanford Site, since the species the State has listed as sensitive in the above comment (loggerhead shrike, Washington ground squirrel, and burrowing owl) are really State candidates.
Vaux's Swift SC

4 Lewis' woodpecker was added to Table 4.12 (Fitzner and Gray 1991 and Landeen et al. 1992).

However, there is no written record of Vaux's swift occurring on the Hanford Site, so this species was not added.

5 A section on the potential impacts to microbiotic crusts has been added to Appendix I of the revised draft HSW EIS.

6 The HSW EIS provides extensive analysis of groundwater contamination and movement. See particularly Section 4.5 (Hydrology), Section 5.3 (Environmental Consequences -- Water Quality) and Appendix G and I.

There were only two chemicals of concern with respect to groundwater in the HSW EIS. These are Iodine 129 (I-129) and Technetium 99 (Tc-99). Their concentrations exceed benchmark maximum contaminant levels for wells located in the 200 West and 200 East areas. Technetium 99 (Tc-99) concentrations exceed benchmark maximum contaminant levels in wells also located in the 200W and 200E areas (DOE 2002). In order to accelerate the clean up of the Hanford site and sites across the complex, it may be necessary to undertake actions which may marginally increase the concentrations of Tc-99 and I-129 in the 200 areas in order to achieve these accelerated clean up schedules. The acceleration of clean up means that the Hanford site is cleaned up sooner than it otherwise would. Thus, MLLW would, at a hypothetical well located 1 km down gradient from the LLBG, marginally increase that concentrations of Tc-99 and I-129. Tc-99 would contribute a maximum of 28% of the benchmark maximum contaminant levels (Alternative 2, upper bound volume, 200W area) and would take 1200 years to

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Comments	Responses
	reach that concentration. With respect to I-129 it would be 110% of the benchmark maximum contaminant levels (upper bound, Alternative 2, 200W area) (Draft HSW EIS 2002).
7	The Council on Environmental Quality (CEQ) regulations require the environmental consequences section of an EIS to identify any irreversible or irretrievable commitments of resources that would be involved in the proposal if it were implemented (40 CFR 1502.16). Section 5.15 has been revised to better clarify what natural resources might be affected. Potential mitigation measures are addressed in Section 5.18.
8	Section 5.5 and Appendix I of this HSW EIS document the biological resources that could be affected. Section 5.18 addresses mitigation measures that might apply to proposed action evaluated in this HSW EIS.
9	Area C is not in the National Monument (65 FR 37253). In consultation with the U.S. Fish and Wildlife Service and the Washington State Department of Fish and Wildlife, Area C was designated for "conservation mining" land use in the Hanford Comprehensive Land-Use Plan EIS (DOE 1999). Area C was selected to avoid damaging an essential wildlife corridor between the Hanford Site and the Yakima Training Center.

Letter: 101

3.3 Native American Tribal Comments and Responses

3.3.1 Nez Perce Indian Nation

NEZ PERCE TRIBE TREATY OF 1855

Nez Perce
ENVIRONMENTAL RESTORATION & WASTE MANAGEMENT
P.O. BOX 365 · LAPWAI, IDAHO 83540-0365 · (208) 843-7375 / FAX: 843-7378

August 19, 2002

Michael Collins
NEPA Document Manager
U.S. DOE, Richland Operations Office
P.O. Box 550, MSIN A6-38
Richland, Washington 99352

Re: Comments on *Draft Hanford Site Solid (Radioactive and Hazardous Waste Program Environmental Impact Statement (HSW EIS)*

Dear Mr. Collins:

The Nez Perce Tribe's Environmental Restoration and Waste Management Program (ERWM) have reviewed the above-mentioned document.

Since 1855, reserved treaty rights of the Nez Perce Tribe in the Mid-Columbia have been recognized and affirmed through a series of federal and state actions. These actions protect Nez Perce rights to utilize their usual and accustomed resources and resource areas in the Hanford Reach of the Columbia River and elsewhere. Accordingly, the ERWM responds to actions that impact the Hanford ecosystem.

General Comments

Our comments come from reviewing the EIS and by having some of our staff attend the Richland Public meeting on August 6, 2002. It is obvious that a great deal of work went into the preparation of the EIS and
1 the intent is good, but in general we concur with most of the comments that have been previously submitted by the Environmental Protection Agency (EPA) and the Hanford Advisory Board (HAB), and voiced at the public meeting in that it still needs a lot of work to make it a functional EIS. Specific comments made by
2 the EPA and the HAB that need resolution include integration of Long Term Stewardship concerns, more
3 specifics on capping and barriers, and more discussion on modeling and inventory assumptions.
4

For the purposes of brevity we will not reiterate very many of their concerns, but will focus on issues that our program feels are important.

5 The document in its present form doesn't appear to meet the needs for which it was intended. One shortfall of the document is that some of the source terms for the various contaminants are not adequately characterized. An example of this is the newly discovered carbon tetrachloride plume. How does the EIS deal with this?

6 Another concern is the proposed importation of waste from other sites. DOE is currently trying to amend the programmatic EIS to allow TRU waste to come onto site from other sources. In its present form the EIS doesn't deal adequately with that issue.

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Specific comments are listed below.

First sentence of the third paragraph in the EPA general comments on the HSW EIS reads: "It appears that
alternatives were formulated based on cost concerns rather than environmental ones." We agree. One of
many examples is found in page S.15, line 20 of the HSW EIS - In general, these three alternatives provide
the most cost-effective and environmentally preferable approach to waste management at Hanford for the
range of waste volumes that might be managed at the Site as a results of WM PEIS decisions. Such an
7 emphasis alerts us to consider that the over-riding motive of DOE at Hanford may be cost, not clean up.

Page 3 of EPA general comments, third paragraph: The Purpose and Need statement is unclear. It should
clearly define the primary and secondary needs of the EIS in relation to Hanford waste and off-site waste.
8 As the HSW EIS currently exists, it cannot adequately address how solid waste management is affecting
the environment because it has not clearly described the potential for taking off-site waste. In the current
atmosphere of accelerated cleanup, this document seems to leave open many possibilities for shifting
9 legacy waste from site to site across the complex without appropriate adherence to human and ecological
environmental protections.

Transportation issues of the HSW EIS in relation to the WM PEIS: The HSW EIS declines to analyze
10 transportation issues because that was done in the Waste Management Programmatic EIS (1996). The WM
PEIS, however, used 1990 census data, which is no longer current or applicable for such analyses.

11 *Specifically in reference to TRU wastes:* There seem to be three categories of TRU waste produced at
Hanford. Nowhere did we find a description of the categories to be expected from off-site. These three
categories of on-site TRU waste are pre-1970 waste, which will apparently continue to be managed as
LLW as there is no discussion about attempts to retrieve any of it; 1970-1984 waste that is "suspect", and
12 set aside, apparently for possible retrieval; and post 1985 TRU waste, which is waiting to be processed and
certified for disposal at WIPP. It should be remembered that any of these categories may contain either
contact-handled TRU waste, or remote-handled TRU waste, which suggests that even small amounts in old
LLW trenches may be of considerable danger to the environment.

<u>Page 3.8, line 23</u> states: "Only small quantities of TRU waste are forecast from offsite generators." The
alternatives for handling the TRU waste management were "evaluated using the maximum TRU waste
13 volume forecast for management at Hanford." What are the "future TRU waste receipts"? Is it appropriate
to give some finite figures and descriptions of these quantities?

<u>Page S.6, line 25</u> – "DOE is determining whether suspect TRU waste should be retrieved and processed as
TRU waste, or whether it can remain disposed of in the LLBGs." However, on <u>Page S.9, line 33</u>, we read,
14 "After onsite characterization and packaging, DOE plans to send post-1970 TRU waste to the WIPP
repository for disposal." It is unclear what is considered "suspect" TRU, and therefore, what will or won't
be processed and sent on to WIPP.

<u>Page G.68, line 40:</u> "TRU waste would be retrieved and sent to WIPP for disposal and would not add to
Hanford groundwater contamination levels." And again, <u>page 5.24</u>, line 10, "Inventories of retrievably
stored TRU waste in trenches and caissons located in the LLBGs were not considered [for long-term
impacts on groundwater] because they will eventually be retrieved and sent to the WIPP for disposal."
15 Thus, the EIS does not evaluate an impact of TRU wastes on groundwater because of the assumption these
wastes will not remain at Hanford. Realizing that DOE is considering leaving some of the Hanford TRU in
place, and in addition not having assurance that all TRU received and processed at Hanford will in the
long-term will be shipped off-site for storage, we are very concerned about the lack of evaluation of the
potential effect of TRU on-site may have on groundwater. In other words, the need for analysis of TRU
impact should not be denied when it is unclear how much TRU will be on-site, and then when and where
TRU will be treated, stored, and disposed.

The short-term groundwater quality impacts of LLW (which can contain pre-1970 TRU waste) are
summarily dismissed as a problem. <u>Page 5.13, line 6,</u> "Because less rigorous requirements for waste

16 contaminant and content were used prior to 1988, contaminants contained in LLW disposed of prior to 1988 offer the highest potential for leaching and release into the vadose zone prior to the time of site closure. However, releases to groundwater from these earlier disposals are not expected to occur during the period of operations." There is no further explanation as to why this expectation exists. Many waste sites have unexpectedly contaminated the vadose zone and groundwater. Why are these sites held to a different standard?

17 Page 5.19, line 7 indicates that "Preliminary estimates of transport times of constituents in Groups 3, 4 and 5 that considered their affinity to be sorbed onto Hanford sediments indicated their release through the thick vadose zone to the unconfined aquifer beneath the LLBGs would be beyond the 10,000 year period of analysis. Thus, all constituents in these groups were eliminated from further consideration." There are current ongoing studies of the sorption characteristics and conditions for a number of these elements, such as cesium and plutonium, because in some sites at Hanford these elements have moved further through the vadose zone than expected and have actually encountered the groundwater. Thus to eliminate them from consideration of having an environmental impact appears to be inappropriate.

18 *Section S.8.5, Cumulative Impacts:* This section contends that the cumulative impacts for the resources considered in the EIS are small and that they would not be expected to contribute substantially to impacts of other Hanford activities. On the contrary we believe that many of these impacts could potentially be very significant, especially for those impacts that may end up exceeding the MCLs in the groundwater.

19 *Appendix I Ecological Resources:* Area C is defined as an area from which future-capping materials may come from. There is no discussion that provides specific information relative to the amount of material that is proposed to be mined and what mitigation measures will be taken. This area appears to be contained within the Hanford Reach National Monument so there should be some discussion about the ramifications and prudence of creating large physical disturbances on a National Monument.

We respectfully suggest that the EIS in its present form is inadequate for its stated purpose, and needs to be rewritten and updated to reflect our concerns, as well as other concerns voiced by other reviewers and agencies.

Sincerely,

Patrick Sobotta
ERWM Director

Cc: Kevin Clarke
Larry Goldstein
Todd Martin

Responses to Letter L101

Comments	Responses
1	To provide information in response to comments, including those provided by EPA and the HAB, the HSW EIS has been revised.
2	Discussion of long-term stewardship has been added to Section 2.0. Additional information on caps and barriers has been added to Appendix G. Additional discussion on modeling including use of the System Assessment Capability are included in Section 5.3, Section 5.11, Section 5.14and associated appendices. Details on inventory assumptions are included in Appendices B and C .
3	See response 2
4	See response 2
5	Future disposals of waste are subject to applicable regulatory requirements which would apply to carbon tetrachloride and other hazardous waste constituents. Discussion of uncertainties regarding previously disposed inventories of waste has been added to Section 3.5. Inventories and impacts of hazardous materials, including carbon tetrachloride, also are described in Sections 4 and 5 and related appendices of the HSW EIS.
6	The HSW EIS has been revised to present some transportation impacts previously analyzed by the Waste Management Programmatic Environmental Impact Statement. A Hanford Only waste volume is now analyzed in the HSW EIS as a way of showing the incremental impacts associated with the receipt of offsite waste. Since this comment was made, the WM PEIS TRU waste Record of Decision has been amended to allow shipments of TRU waste from Ohio and California to Hanford prior to eventual shipment to WIPP. The HSW EIS has been revised to address receipt of TRU waste from these generators and other offsite generators.
7	DOE's primary concern is the cleanup of Hanford and other DOE sites across the country, and addressing those sites that present the greatest risks to the environment and public/worker health. DOE supports achieving cleanup goals and objectives at a lesser cost, if possible by pursuing innovative approaches to cleanup and new technologies. Resources are not unlimited and to the extent existing resources can be used more efficiently, then more cleanup can be accomplished per dollar spent.

Responses to Letter L101

Comments	Responses
8	This revised draft HSW EIS includes a revised purpose and need statement that was developed in consultation with EPA and Ecology staff. The statement includes disposal of existing and anticipated quantities of Hanford waste streams and potential wastes from offsite sources. A Hanford-only waste volume is now analyzed in the HSW EIS as a way of showing the incremental impacts associated with the receipt of offsite waste. Decisions regarding final waste disposition appropriately adhere to requirements to protect human health and the environment.
9	See response 8
10	The HSW EIS has been revised to present some transportation impacts previously analyzed by the Waste Management Programmatic Environmental Impact Statement.
11	All the offsite TRU waste is evaluated as part of the newly-generated TRU waste. Most offsite TRU waste is assumed to be contact-handled, some is assumed to be remote-handled. A portion of the offiste TRU waste is expected to contain mixed waste constituents. Retrieval of TRU waste from the LLBGs ("the 1970-1984 waste that is suspect") has already started. Shipment of TRU waste to WIPP has also started. Over one third of the TRU waste in the LLBGs is scheduled to be retrieved by 2006 (Hanford Performance Management Plan [HPMP] DOE 2002). Retrieval will be completed before the end of the operational period. No substantial releases are expected to occur before the waste is retrieved. Please see Response 136. Decisions regarding "pre-1970 TRU waste" would be made through appropriate CERCLA or RCRA past-practice processes in collaboration with EPA and/or Ecology. The environmental impacts of "pre-1970 TRU waste" are addressed as part of the cumulative impacts in Section 5.14 and Appendix L.
12	See response 11
13	A greater amount of offsite TRU waste is evaluated in the revised draft HSW EIS. The HSW EIS has been revised to show the TRU waste from offsite.
14	TRU waste retrievably-stored in the LLBGs is considered to be "suspect" because some of it would no longer meet today's definition.

Responses to Letter L101

Comments	Responses
15	The HSW EIS assumes that 50% of the "suspect" TRU waste upon analysis will meet the definition of TRU waste. TRU waste will be sent to WIPP. The remaining waste will stay in the LLBGs. THE HSW EIS does analyze the potential impacts of waste remaining in the LLBGs. All TRU waste received from offsite generators will eventually be shipped to WIPP.
16	All waste (except the retrievably-stored TRU waste) in the LLBGs is addressed as part of the groundwater analysis (see Section 5.3 and Appendix G). The cumulative impacts of Hanford activities not included as part of the alternatives addressed in the HSW EIS, including pre-1970 waste are addressed in Section 5.14 and Appendix L. Most of the contaminants in the vadose zone and groundwater were the result of now-discontinued liquid waste disposal activities.
17	This response will focus on the basis for the screening out of plutonium and other constituents in this analysis as described in detail in Section G.1.1.1. This assessment relied on estimates made by recently completed performance assessments and other analyses. Specific estimates of distribution coefficients for plutonium were taken from estimates described in the Composite Analysis (Kincaid et al. 1998). These estimates ranged from 80 to greater than 1980 ml/g, with a best estimate value of 200 ml/g. In this analysis, all plutonium isotopes was conservatively grouped in with other constituents that were categorized as strongly sorbed in Group 5 where the distribution coefficient were assumed to 40 ml/g or greater. As a part of the screening analysis, estimated travel times of contaminants within groups 3 ($k_d = 1$), 4, ($k_d = 10$), and 5 ($k_d = 40$) categories through the thick vadose zone to the unconfined aquifer beneath the LLBG's were calculated to well beyond the 10,000-yr period of analysis. The evidence cited by the commenter likely is referring to recently collected evidence found in the vadose zone impacted by past leaks at wastes from source areas in tank farms. This evidence may be relevant to these past leak conditions and extreme geochemical conditions associated with Tanks but cannot be interpreted as representative of the geochemical or vadose zone flow and transport conditions that would be expected under solid waste burial grounds. There is no specific evidence that would support similar enhanced movement of cesium or plutonium from sources in LLBGs. The most recent information on distribution coefficients available in Cantrell et al. (2002) summarize available Kd information on plutonium and note the quantity and quality of plutonium adsorption studies conducted with Hanford sediment are much less than those available for many other contaminants of interest at the Hanford Site. Delegard and Barney (1983) conducted a series of plutonium adsorption experiments on Hanford sediment at high base concentrations and variable concentrations of chelating agents. From their results, it was demonstrated that even at high base concentrations

Responses to Letter L101

Comments **Responses**

plutonium adsorption was moderately high. Combination of high base concentration and high ethylenediaminetetraacetic acid concentration reduced plutonium adsorption the most; however, even under these conditions significant adsorption occurred. Hajek and Knoll (1966) conducted Pu adsorption experiments on Hanford sediment from high salt acid waste consistent with some tank waste environment but not geochemical conditions expected for LLW or MLLW. Under these conditions, the K_d values for Pu were determined to be less than 1. In another study conducted by Rhodes (1952, 1957), K_d values for Pu were measured on Hanford sediment at different solution to solid ratios, variable initial Pu concentrations and a range of pH values from 0.5 to 14. In general, these results indicate high Pu adsorption, except at very low pH. The results of Rhodes at low and high pH are not consistent with the previous results discussed. It is possible that the high K_d values determined by Rhodes resulted from precipitation as a result of the high initial Pu [stated to be Pu(IV)] concentrations used in the experiments.

Based on the limited data available for Pu, it appears that Pu will be fairly immobile except at very low pH values or high ethylenediaminetetraacetic acid concentrations. These extreme conditions are not likely to exist in LLW or MLLW associated with LowLevel Waste Grounds.

Cantrell et al. (2002) also summarize the current state of knowledge for cesium. Under normal Hanford conditions, Cs(I) adsorption is high with Kd values in excess of 1,000 mL/g. Even in the presence of acidic process waste, Cs(I) adsorption remains high. This is partially due to the high acid neutralizing capacity of Hanford sediment resulting from its generally high carbonate content. The pH values measured for acidic process waste (initially pH 3.5) after contact with Hanford sediment was 4.1 to 7.5 (at solution to solid ratios of 30). Gee and Campbell (1980) demonstrated that high concentrations of K+ can dramatically reduce Cs(I) adsorption; however, such high K+ concentrations are not likely to occur at the Hanford Site. Serne et al. (1998) has shown that various simulated tank (T-106) waste (pH 12, with various salts at high concentration) can significantly reduce Cs(I) adsorption. The most dramatic decrease in Cs(I) adsorption occurs when high Ca(NO3)2 (3.5 M) is included as a component of the simulated tank waste (along with relatively high concentrations of NH4+ and K+). REDOX liquors that have much higher base (pH>14), Al, Na, and nitrate concentrations, have been found to have higher Kd values than those of the T-106 tank waste simulants. It has been hypothesized that precipitation of high-surface-area aluminum-hydroxide phases may be responsible for this effect Serne et al. (1998). It is also likely that the much lower concentrations of Ca2+, NH4+, and K+ in the REDOX liquors were also very important factors.

One must keep in mind that potassium and ammonia are below cesium in the lytropic series and the only way that it could be affected is through mass effects. The concentration of potassium or ammonia would have to be very high and you'd have to put a lot

Comments **Responses**

through.

Zachara et al. (2002) have presented a detailed mass action ion exchange model for Cs(I) adsorption onto Hanford sediment. This model is sensitive to the concentration of Cs(I) in the system because of selective adsorption sites (frayed edge sites on mica minerals) that are present in low concentrations that control Cs(I) adsorption at low aqueous Cs(I) concentrations. In addition, high salt concentrations that exist in tank waste greatly reduces Cs(I) adsorption. As a result of this work, it is clear that modeling Cs(I) adsorption in the vicinity of a tank leak will not be amenable to modeling with a single linear adsorption isotherm.

In summary, it appears that Cs(I) transport through the Hanford Site vadose zone and groundwater will be negligible except under conditions of extremely high salt concentration [Ca2+, NH4+, and K+ are particularly good competitors for adsorption sites with Cs(I)] such as conditions in the vicinity of leaks from certain tanks farms or a discharge sites that may have received similar wastes in the past. These extreme conditions are not likely to exist in LLW or MLLW associated with Low-Level waste burial grounds.

With regard to the effect of hazardous chemicals on the mobility of radionuclides, there is no field-scale evidence of organic compound (i.e. solvents or complexing agents) impacts at other nuclear LLW sites across North America (Serne et al. 1990 and 1995). Hanford Site experience and tabulations of metal-organic complex stability constants for organic compounds typically contained in LLW and MLLW such as found in Martell (1971), Martell and Smith (1977), Smith and Martell (1982), would suggest that most of these organics are non-polar and relatively hydrophobic molecules, such as tributyl phosphate. These types of organics cannot complex metals and radionuclides and will not be important in their filed-scale transport from HSW-EIS disposal sites. Such non polar and/or hydrophobic organic compounds if disposed in large quantities and high concentration could potentially affect radionuclide and metal migration by creating a reducing zone, however, field evidence suggests that this did not occur to any significant extent at the Hanford Site (see Serne and Wood 1990 and references therein). One exception would be Tributyl phosphate (TBP) but even TBP is viewed as a weak complexant and after any dilution will not be capable of mobilizing metals and radionuclides over significant distances (Martell 1971, 1977; Serne and Wood 1990; Serne et al. 1990, 1995; Smith and Martell 1982; Cantrell et al. 2002; Delegard and Barney 1983).

Responses to Letter L101

Comments	Responses
18	The HSW EIS has been revised to address additional alternatives. The DOE believes that the reasonably foreseeable cumulative impacts of the proposed actions will be small, as indicated by the draft HSW EIS evaluations of the alternatives (see Section 5.14 and Appendix L). Maximum contaminant levels (MCLs) established under the federal Safe Drinking Water Act provide a useful basis for comparison of groundwater contaminant concentrations that might result from LLBG disposal activities. Only Alternative Group B and the No Action Alternative show MCLs being exceeded (see Section 5.3 and Appendix G). In none of the alternatives would the applicable dose limits be exceeded (see Section 5.11 and Appendix F).
19	Section 5.10 includes a list of the natural resources that would be mined from Area C. Section 5.12 discusses restoration efforts. Additional information on mitgation measures has been provided in Section 5.18. Area C is not part of the National Monument (65 FR 37253).

Letter: L105

3.3.2 Confederated Tribes of the Umatilla Indian Reservation

30 August 2002

Mr. Mike Collins
Department of Energy
Richland Operations Office
825 Jadwin Ave., Mail Stop A6-38
Richland, WA 99352

Dear Mr. Collins;

On behalf of the Environmental Science and Technology Program (ESTP) of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), I am submitting the following comments to the Draft Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement. Given the highly technical nature of this document and the potential impacts this change will have on the operations at the Hanford Site, the CTUIR may provide further comments to your office in the future.

If you have any questions concerning this matter please feel free to contact me at (541) 966-2413.

Sincerely;

Mr. Richard Gay
Acting Manager, CTUIR-ESTP
Cc:
Armand Minthorn, Member, CTUIR-BOT
Kevin Clarke, DOE-RL
File

Enclosure

Comments to Summary

Section S.4, Page S.5: "*Waste that does not meet the HSSWAC is stored until it can be treated to permit final disposal.*"

1 **Comment**: The CTUIR is concerned that waste stored at the site will ultimately be abandoned in place.

Requested Action: Please clarify how and where the material will be treated to meet the HSSWAC.

Section S.8.3, Page S.19, Table S.3: "*Potential for impacts on cultural resources "Low".*"

Comment: It is difficult to surmise how the Department can assert that the impact of
each scenario on cultural resources is low. Disposal of low-level waste and mixed waste
on the Hanford site will have numerous cultural impacts. First, the 200 Areas will
become sacrifice zones where access will be permanently restricted for cultural purposes.
Second, the springs and seeps along the Columbia River will be contaminated and so
2 unusable for numerous generations. Third, from a Tribal perspective, the biota associated
with the Columbia River ecosystem has the potential of being contaminated with
radionuclides and so will also be unusable for millennia.

Requested Action: Please reconsider the impacts of these disposal options on cultural resources.

Comments to Chapter 1

Section 1.4.5.1, Page 1.11: "*DOE would construct new disposal capacity using a deeper, wider trench design…*"

Comment: What is the reason for redesigning the trenches? If the new design is superior
to the old design why was it not included in both alternatives since both require the
3 installation of new trenches?

Requested Action: Please address the questions listed in the above comment.

Letter: L105

Comments to Chapter 2

Section 2.1.1, Page 2.3: "*However, some bulk waste (that is soil or rubble) is disposed of without containers.*"

4 **Comment**: The disposal of this material without containers will result in the potential for immediate leaching of contaminants from the burial trenches. This should be accounted for in the contaminant transport analysis

Requested Action: Please verify that the indicated assumption was included in the contaminant transport analysis.

Section 2.1.1.2, Page 2.4: "*Cat 3 LLW…high-integrity containers (HICs) or by creating a monolithic waste from the trench…*"

5 **Comment**: The assumption implied by placing Cat 3 LLW in containers is that the container will delay the release of contaminants to the environment and reduce the hazard. Has the Department evaluated the lifetime of the containers in comparison to the lifetime of the hazard placed in the containers? Do the containers result in a reduction in the release of contaminants over time or mealy a delay in when the release occurs? If the containers reduce the release, has the Department considered using this additional containment for all LLW?

Requested Action: Please address the questions raised in the above comment.

Section 2.2.2.3, Page 2.18: "*If the leachate does not meet these requirements, an alternative treatment is required.*"

6 **Comment**: What alternative treatment technologies are being considered?

Requested Action: Please clarify what alternative treatment technologies being considered for leachate.

Section 3.5.3.1, Page 3.11: "*ERDF was rejected as an option because none of the LLW or MLLW under evaluation in the HSW EIS would be generated by CERCLA actions.*"

7 **Comment**: This statement indicates that a paper technicality has eliminated a potential option for disposal of LLW and MLLW. If contaminant transport analysis were to indicate that ERDF were a more protective solution for the LLW and MLLW, would it not be possible to get around this regulatory roadblock? Has the Department evaluated

whether ERDF is technically a viable option for the disposal of LLW and MLLW? Would ERDF provide a better technical solution?

Requested Action: Please clarify whether ERDF would provide a better technical solution for disposal of LLW and MLLW.

Comments to Chapter 5

Section 5.2, Page 5.5: General Comment.

8 Comment: The air quality analysis focuses on criteria air pollutant emissions from activities associated with construction and capping of the borrow pit. The analysis fails to examine haze and visibility or consider the cumulative air quality impacts of these activities. Other activities that will be occurring in the area (e.g., the Waste Treatment Plant) will also be producing problematic and regulated air emissions. This assertion is particularly true since diesel powered boilers are proposed for the Waste Treatment Plant.

Requested Action: Conduct a cumulative air quality impact analysis that takes into account all sources of air pollution at Hanford. This analysis should include evaluation of haze and visibility parameters.

Section 5.3 Page 5.12: "*As a result of wastewater management activities during past Hanford Site operations, groundwater beneath the 200 Areas has been contaminated with radionuclides and non-radioactive chemicals. The contaminants emanating from the 200 Areas are moving toward the Columbia River. None of these contaminants are thought to have originated from the LLBGs.*"

9 Comment: Contamination is emanating from the 200 area towards the Columbia River from sources that where not direct discharges to the vadose zone, nor were they intended to "leak". An example is the contamination coming from the tank farms. Thus the argument should not be made that LLBG's could not be a source of contamination. In addition, other burial grounds outside of the 200 area, such as the 618-10 and 618-11 site are a source of contamination.

Requested Action: Please provide the quantitative justification for the above statement made in the EIS.

Section 5.3.1, Page 5.12: "*In the case of capping of LLBGs at closure where water is used for short-term dust suppression, the 25-cm (10-in) layer of asphalt at the base of the*

3

Letter: L105

cap is expected to divert water away from the waste and would not be expected to result in impacts on groundwater quality."

10

Comment: Water could migrate into site laterally due to clay layers under the site. The water is not limited to vertical migration alone.

Requested Action: Provide evidence of the effects of laterally migration of moisture on the movement of contaminants from the proposed LLBGs.

Section 5.3.1, Page 5.12: "*The thick vadose zone (see Section 4.5) between the LLBGs and the underlying water table is expected to limit any release of contaminants from the LLBGs to groundwater until well after the time of site closure.*"

11

Comment: Having any waste leak into the ground water is unacceptable and contradictory to the accelerated cleanup plan for site closure. In the past, it was also argued that there would not be any waste leaking into the ground water from past activities on the 200 area due to the thickness of the vadose zone. This theory was found to be invalid once the contamination was discovered beneath the 200 areas.

Requested Action: Reevaluate the waste disposal options that will result in migration of contaminants into the vadose zone and ground water to determine if options exist to further limit contaminant migration.

Section 5.3.1, Page 5.13: "*LLW, disposed in the LLBGs, are largely dry solid waste disposals. Category (Cat) 1 and 3 LLW disposed of since 1988 follow stringent Hanford Site Solid Waste Acceptance Criteria (HSSWAC) for waste containment and content (i.e., use of steel boxes, drums, high-integrity containers, and grouted waste forms) that will minimize leaching and release of contaminants during the period of operations.*"

12

Comment: Just because the waste is dry does not mean the containers will not become damaged from moisture. As an example, old drums have been found on the Hanford site that have rusted through. Part of this rusting is the result of soil moisture. In addition, the CTUIR is concerned about leaching and release of contaminants beyond the "period of operations." CTUIR has a long-term interest in this area, and as such, any contaminates that may leach into the environment.

Requested Action: Reevaluate the waste disposal options that will result in migration of contaminants into the vadose zone and ground water to determine if options exist to further limit contaminant migration.

4

Section 5.3.1, Page 5.13: "*Because less rigorous requirements for waste contaminant and content were used prior to 1988, contaminants contained in LLW disposed of prior to 1988 offer the highest potential for leaching and release into the vadose zone prior to the time of site closure.*"

13 **Comment**: If the waste was stored in containers prior to 1988, there is a greater chance of this leaching into the environment. Again, the CTUIR is concerned about waste leaching into the environment beyond the time of site closure.

Requested Action: Reevaluate the waste disposal options that will result in migration of contaminants into the vadose zone and ground water to determine if options exist to further limit contaminant migration.

Section 5.3.2, Page 5.13: "*Wastes considered in this assessment include previously disposed LLW and LLW to be disposed in the LLBGs as follows:*

- *LLW disposed of between 1962 and 1970 (referred to as pre-1970 LLW in this section)*
- *• LLW buried after 1970 but before 1988 (referred to as 1970-1988 LLW in this section)*
- *• Cat 1 LLW disposed of after 1988 including LLW forecasted to be disposed of through 2046 (referred to as Cat 1 LLW in this section)*
- *• Cat 3 and greater than Cat 3 (GTC3) LLW disposed of after 1988 including LLW forecasted to be disposed of through 2046 (referred to collectively as Cat 3 LLW in this section)*
- *• MLLW disposed of after 1988 including waste forecasted to be disposed of through 2046 (referred to as MLLW in this section).*"

14 **Comment**: Many different waste types will be disposed of in the LLBG.

Requested Action: A thorough waste evaluation, type, categorization, and classification is needed for all wastes that will be and have been disposed of in the LLBG. This level of detail is needed to assure the containers are adequate since the classification of waste types have changed over time but the waste has not. This level of detail is also need for modeling any movement of waste through the vadose and ground water system.

Section 5.3.2, Page 5.14: "*Inventories of retrievably stored TRU waste in trenches and caissons located in the LLBGs were not considered because they will eventually be retrieved and sent to the WIPP for disposal.*"

15 **Comment**: TRU waste will be "temporarily disposed" in the same trenches as the MLLW and the LLW. Is there a time-line on when these wastes will be dug up and removed from site? Could the trenches become a *de facto* long-term storage facility for

these and other wastes? These wastes were not considered nor the danger analyzed because they will eventually be removed. Yet the danger from having these wastes on-site is still present. DOE's assessment of risk and analysis is somewhat flawed because they are ignoring this data.

Requested Action: Please address the potential impacts of leaving the TRU waste in place. Also add a discussion of the probability that this material might be left in the trenches and not sent to WIPP.

Section 5.3.2, Page 5.14: "*The groundwater modeling results estimate contaminant concentrations in the groundwater associated with selected alternatives evaluated in this HSW EIS from the end of waste operations in 2046 up to 10,000 yr from 2046.*"

Comment: Will some of this waste still be present and a potential threat for longer than 10,000 years?

16 **Requested Action**: Please provide a detailed analysis of the amount of contaminants that will enter the groundwater and river system over the duration the hazardous materials will exist. This analysis should include the projected concentrations of the material at the river interface over the entire time period that contaminants will enter the river, and the projected cumulative concentrations of the materials in the various components of the river system including the sediments, water, and biota. Also, the health effects of the full release of material on the river system should be discussed.

Section 5.3.2, Page 5.14: "*The points of assessment for this analysis were located on the Hanford Site at hypothetical wells located approximately 1 km (0.6 mi) down gradient of the 200 East and the 200 West Area LLBGs and at a hypothetical well near the Columbia River located down gradient from both areas (see Figure 5.2). All well locations were selected based on simulated transport results of unit releases at selected LLBGs locations used in this assessment. Details of these unit release calculations are presented in Appendix G. The hypothetical wells 1 km down gradient from the LLBGs were selected to represent contaminant concentrations in the unconfined aquifer immediately down gradient of the LLBGs. A hypothetical well near the Columbia River is representative of a well dug in the unconfined aquifer for domestic uses and as a surrogate for conditions at river shore springs. In addition the concentrations of nuclides at the near river well were used to estimate quantities of nuclides reaching the Columbia River. The near river well location was found based on contaminant plume shape to be close to the Old Hanford Town Site.*"

17 **Comment**: This analysis is strong evidence that this EIS is flawed. There are many reasons why the sampling from a single well is NOT representative of the ground water conditions. Several of these reasons are outlined below:

1. The ground water flow is currently still in a state of flux. The flow conditions are not known well enough to place a signal well in the flow path.
2. A single well for the purposes of monitoring contaminates from these LLBG in even a known ground water table is insufficient to assure ground water quality.
3. As is evident from Figure 5.2, these three wells are not currently located in the path of the current ground water flow directions. The current Tritium and other plumes are trending more to the Southeast. These proposed wells would not be able to capture this plume and define this flow. In fact, the third well along the Columbia River appears to be located on the other side of a ridge or a barrier to the ground water flow direction. This would be a good way to assure that any level of contamination is not measured in this monitoring well.
4. The ground water has been shown to sometimes have preferred pathways of flow. This shows up along the Columbia River as springs day-lighting along the river. The ground water flow directions are currently not well defined (as seen via the recent contamination from 618-10 and 618-11 plume). Thus it can not be expected that a single well would be able to capture a plume nor be in the path of the flow.
5. The hypothetical well near the Columbia River is essentially a shallow well that may be capturing river water or water that may be partially diluted with Columbia River water. The discharge of some of the ground water pathways may be further out under the Columbia River as was shown in Dr. Robert Peterson's ground water simulations.

Requested Action: Please assess the potential impacts of the LLBGs using points of maximum concentration versus time derived from the modeling results. This analysis will provide a better understanding of the predicted concentrations in the ground water.

Section 5.3.2, Page 5.15: "*To establish the relative mobility of the constituents, they were grouped based on their mobility in the vadose zone and underlying unconfined aquifer. Contaminant groupings were used rather than the individual mobility of each contaminant because of the uncertainty involved in determining the mobility of individual constituents.*"

18

Comment: Some of these contaminants interact and affect the overall mobility. For example, if binding sites are occupied by one contaminant, then it is not available for another contaminant. Thus that second contaminant would be more mobile and be transported further than if it was in the system by itself.

Requested Action: Please add a discussion of the potential impacts of multiple contaminants on the mobility of individual species through the vadose zone and ground water. Quantitative estimates of synergistic effects must be included in the discussion.

Section 5.3.2, Page 5.16: "*Because of its affinity to be sorbed onto Hanford Sediments, lead falls within…*"

19 **Comment**: Are the assumptions for contaminant mobility within the vadose zone and ground water consistent with present monitoring data?

Requested Action: Please compare the assumptions, and the results they generate to determine if they are consistent with observed levels of contamination within the 200 Areas.

Section 5.3.2, Page 5.17: "*TRU waste retrievably stored in trenches and caissons would be retrieved, treated, repackaged as necessary, processed, and shipped for final disposal at WIPP, hence no impacts on Hanford groundwater quality would be expected from these wastes and are not considered further.*"

20 **Comments**: Depending on the length of time of storage, state of storage, environmental conditions, etc., there could be impacts from this TRU waste and as such, it should be modeled in the ground water contamination scenario.

Requested Action: Please include the impacts of buried TRU waste in the evaluation of ground water impacts.

Section 5.3.2.1, Page 5.17: "*Source-term release for the LLW was estimated using the soil-debris release model. In this model, the waste itself is assumed to have the same hydraulic characteristics of the surrounding soil materials.*"

21 **Comment**: This assumption appears to be a large departure from the actual properties of the waste. How sensitive are the projected ground water concentrations to this assumption? Also, the last sentence of this bullet lists uranium solubility as 0.2 g/L which is inconsistent with the value reported on Page 5.18.

Requested Action: Please provide a sensitivity analysis for this parameter. In addition, verify that a correct value for uranium solubility is presented in this section.

Section 5.3.2.1, Page 5.17: "*The infiltration rate was assumed to be 0.05 cm/yr to reflect the effective recharge through the assumed RCRA Subtitle C barrier placed over all the LLBGs. In the absence of the RCRA cover, the assumed infiltration rate used was 0.5 cm/yr.*"

22 **Comment**: Was a breakdown in the projected barrier after its design life included in the analysis of contaminant migration? This feature will be important to include in the model since the cap is very unlikely to maintain its integrity for 10,000 years.

Requested Action: Please evaluate the effects of cap degradation on waste mobility over the lifetime of the hazard.

Section 5.3.2.1, Page 5.17: "*In the absence of artificial recharge, vadose simulation results based on this assumed infiltration rate indicated a travel time to the water table of about 500 yr in the 200 East Area and 900 yr in the 200 West Area.*"

23

Comment: Hasn't contamination reached the ground water in the 200 areas much faster than these assumed rates? Also, given the differences in the travel times, has the Department considered using only the 200 West Area as a disposal sight?

Requested Action: Please indicate whether this assumption is consistent with present observations. Also, please comment on why the 200 East Area is a suitable site for waste disposal given it is closer to the river and travel times to ground water are substantial shorter than for the 200 West Area.

Section 5.3.2.2, Page 5.18: "*Because all LLW in this category is buried in high-integrity containers (HICs) constructed of concrete or in-trench grouted, the release calculations considered a 300-yr delay in release (expected lifetime of an individual HIC).*"

24

Comment: Have some containers and grouting been found to have a shorter lifespan than expected due to the interaction of the radioactive and hazardous waste with the grout and cement material? 300 years is a relatively short time-frame considering the life-span of the contaminants.

Requested Action: Please site the reference used to indicate that a 300 year life span is a reasonable assumption for the HICs and in-trench grouted waste.

Section 5.3.3, Page 5.19: "*Selenium and chlorine were not included in the assessment because the total inventories for both of these constituents were estimated to be less than 0.01 Ci.*"

25

Comment: What fraction of Group 1 radioactivity is represented by the projected inventory of selenium and chlorine?

Requested Action: Please indicate in the text the fraction of Group 1 radioactivity that is represented by the projected inventory of selenium and chlorine.

Section 5.3.3, Page 5.19: "*Preliminary estimates of transport times of constituents in Groups 3, 4, and 5 that considered their affinity to be sorbed onto Hanford sediments indicated their release through the thick vadose zone to the unconfined aquifer beneath* *the LLBGs would be beyond the 10,000-yr period of analysis. Thus, all constituents in these groups were eliminated from further consideration."*

Comment: It appears that many assumptions have been made to eliminate constituents from the analysis rather than including them in the event that they could enter the environment. This is not an expectable approach for this EIS since we know that contaminants have migrated in the 200 area vadose zone and aquifer far beyond the distances the extent expected just a few years ago.

26

Requested Action: The contaminant transport modeling used for this EIS does not appear to account for our current knowledge of contaminant transport at Hanford, nor is there an uncertainty analysis for the solution. This is an unacceptable approach since the results of the model are the primary method being used to determine whether or not resources will be impacted by solid waste burial. Please evaluate the transport parameters used in the model and determine if they are consistent with our current understanding of contaminant transport at Hanford. Also, please provide an uncertainty analysis on the solution given the possible variability of the input properties.

Section 5.3.3, Page 5.20: "*....Concentration levels in the Columbia River after groundwater discharges of this magnitude are introduced and mixed with the annual total river flow (at 3300 m3/s) would be significantly diluted.*"

Comment: The ground water is discharged in distinct zones rather than as an overall seep. This can be seen at the surface as locations where springs daylight. These locations are where contaminants would also be more concentrated. In addition, some contaminants could bioaccumulate in the environment. The bioaccumulation of materials will result in the concentration of materials in the food chain and potential negative long-term health impacts on those using natural materials from the Columbia River. As such, it does not seem reasonable to use a drinking water standard as an indication of the
27 impacts of the releases at the river.

Requested Action: Please provide an analysis of the increases in concentration of accumulating contaminants in the Columbia River biota and the long-term health risks associated with those using these materials as a food source. This analysis should include aquatic species, plants, and the terrestrial organisms that consume the plants and river water.

Section 5.5.5, Page 5.24: "*There is no evidence for adverse impacts on aquatic biota for any of the alternatives.*"

28 **Comment**: The authors provide no supporting evidence for this statement, nor does it appear that any analysis was conducted to estimate the potential impacts of bioaccumulative contaminants on the Columbia River ecosystem.

Requested Action: Please provide supporting evidence for this statement.

Section 5.11, Page 5.43: "*The impacts to populations downstream of Hanford have also been evaluated for Tri-Cities, Washington, and Portland, Oregon. The entire populations of the cities were assumed to use the Columbia River as the sole source of drinking water...*"

29 **Comment**: It appears that the only source of contamination ingestion was the drinking of river water. If the consumption of contaminated biota were included would the conclusions of this document be altered?

Requested Action: Please address the question raised in the above comment.

Section 5.14.1, Page 5.102: "*Because of past practices, some of the land within the 200 Area has been already committed in perpetuity for waste disposal. The reason for this commitment is the current presence in soil of radionuclides that had been discharged to ground or leaked from tanks.... Actions addressed in all alternatives in this EIS and similar future disposal actions, such as onsite disposal of immobilized low-activity tank waste, would add to that commitment.*"

30 **Comment**: This is a true statement. Substantial subsurface contamination already exists within the 200 Area at Hanford and the proposed burial grounds will add to this contamination. However, it is not clear whether the presence of the current contamination was taken into account when modeling contaminant transport from solid waste disposal areas. The presence of other contaminants has the potential to both increase detrimental health impacts as well as change contaminant mobility.

Requested Action: Please clarify whether the presence of other contaminant plumes has been included in the analysis presented in this EIS. Also, comment on the cultural impacts on Native Americans of leaving the 200 Areas as sacrifice zones.

Section 5.14.5.3, Page 5.106: "*Leaching of radionuclides from wastes disposed of in LLBGs, within the scope of this EIS; and their transport through the vadose zone to groundwater and on to the Columbia River would, in the long-term, lead to small additional collective doses (less than 0.15 person-rem) to down stream populations as indicated in Section 5.11.*"

Letter: L105

31 **Comment**: Are additional doses acceptable to the goal of cleaning up Hanford and the Columbia River reach? If the river corridor is turned over to another agency to manage, are they aware that there will be additional contamination discharging from their managed area into the Columbia River. Also, has the Department of Energy considered the accumulative dose of radiation experienced by down stream populations from all Hanford derived contamination?

Requested Action: Please evaluate the impacts of the proposed burial grounds in light of all contamination entering the groundwater and river.

Section 5.14.5.3, Page 5.106: "*Because of extremely low infiltration rates of water in the absence of process water discharge, and with the very low rate of precipitation; it is expected that it will take centuries to millennia for the contaminants in the plumes and in the vadose zone beneath presently contaminated near-surface soils or LLBGs to be completely delivered up to the Columbia River.*"

32 **Comment**: Unfortunately the hazard associated with these compounds will outlive the projected transport times and resulted in contamination of water.

Requested Action: Note comment.

Section 5.14.5.3, Page 5.106: "*As may be noted in Section 5.3, at a maximum, the concentrations of mobile nuclides at a near-river well or spring would be small in comparison to derived permissible drinking water contaminant concentrations. Future activities, for example, disposal of low-activity tank waste, can be expected to result in small increases in concentrations of contaminants in groundwater in the distant future. Since individual contaminants will move at different rates and be spread over very long time periods, it is not expected that they would add significantly to impacts from past activities.*"

33 **Comment**: The DOE is counting on concentrations near the Columbia River to be small due to dilution of contaminants. These may not be small if the ground water has preferred flow pathways and discharges from smaller, concentrated zones. It does not appear wise to this reviewer to make such assumptions without a better understanding of the true system being represented.

Requested Action: As has been mentioned in previous comments, the contaminant transport modeling must be validated and a sensitivity analysis is necessary to determine the uncertainty of the model results.

Section 5.14.5.3, Page 5.108: "*Because the occurrence of contaminants reaching the Columbia River will be over very long periods of time, the impacts would be multi-generational (that is, extend over many generations in the future) but would be smaller for any given generation than that received by the generation centered on Hanford's period of special nuclear materials production.*"

34 **Comment**: Due to the bioaccumulation of contaminants in the environment, some of these impacts may not be as minor as is claimed. The multigenerational impacts have to assume that contaminants are being removed from the system at a rate equal to, or greater than their entry rate.

Requested Action: As has been stated before, the effects of bioaccumulation of contaminants must be included in this analysis.

Section 5.14.5.3, Page 5.108: "*Plumes of contaminants (for example, tritium and Tc-99) presently in groundwater are moving down gradient toward the Columbia River. Although these contaminants would not be expected to result in substantial doses to downstream users of Columbia River water, quantities and arrival times at sources of public drinking water have not been quantified.*"

35 **Comment**: More work needs to be done to determine what the impacts and quantities are to the public drinking water and to the environment before a statement can be made where it is expected that there won't be any impacts.

Requested Action: Please quantify these impacts.

Section 5.15, Page 5.109: "*In addition, after a few hundred years following disposal, groundwater beneath the LLBGs would be contaminated by continued slow entry of radionuclides and might, depending on concentrations at the time and down-gradient location of interest (generally easterly to north-easterly from 200 Areas to vicinity of the Old Hanford Town Site), constitute a continuing (thousands of years) commitment of a water resource. The criteria for restricted groundwater use and area extent of such commitment have not been quantified. When the groundwater reaches the Columbia River and is diluted by the large flow of the river, the contamination levels would fall well below those for which restricted use would be necessary to comply with the National Primary Drinking Water Regulations (40 CFR 141).*"

36 **Comment**: Will there be resources available for thousands of years to monitor and remediate this site if the contaminants reach unacceptable limits? In addition, if there is a "continuing (thousands of years) commitment of a water resource" from exposure to these additional contaminants, will there be a continuing commitment of financial

resources to help the CTUIR monitor the problem to assure that their treaty rights are not being violated?

Requested Action: Please address the questions mentioned above.

Response Letters to L105

Comments	Response
1	This Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement (HWS EIS) evaluates several alternatives for treatment of waste to allow disposal in accordance with the HSSWAC including offsite commercial treatment, onsite treatment in existing facilities, and treatment at a new onsite facility. All action alternatives evaluated in the EIS include treatment and final disposal of waste. The No Action alternative, mandated for evaluation under NEPA, is the only alternative in which waste remains in storage indefinitely.
2	The NEPA reviews and decisions leading to the development of the HSW EIS are summarized in Section 1.5.2. The HSW EIS analyzes alternatives for radioactive waste management actions that might be taken at Hanford. The HSW EIS addresses the impacts on cultural resources (see Section 5.7 and Appendix K). Analyses performed as part of the HSW EIS indicate that the potential impacts of the proposed action to seeps and springs along the Columbia River would be small. Further, the impacts to plants, animals, and people of the proposed action would be small.
3	A deeper, wider trench design is expected to reduce both the overall cost for waste disposal and the amount of land disturbed for this disposal. Evaluation of both the deeper, wider trench design and the current design provides a basis for comparison of the environmental impacts associated with the two different designs.
4	Bulk waste is generally slightly contaminated soil or construction debris. Bulk waste and other waste not contained in high integrity containers or grouted in place (but possibly contained in other types of waste containers like steel drums and steel boxes) are currently evaluated using the soil debris release model which makes no provision for containment and assumes that the entire inventory is available for leaching at the start of release period. Description of the assumptions and the release modeling used are described in detail in Appendix G.
5	The department has evaluated the performance of the containers and has assumed a 500- year period which is sufficient for most of the curies to decay away. The containers delay the release of the remaining radionuclides. See the following references: Wood M.I., R. Khaleel, P.D. Rittmann, A.H. Lu, S.H. Finfrock, R.J. Serve, K.J. Cantrell, and T.H. De Lorenzo, 1995, Performance Assessment for the Disposal of Low-Level Waste in the 200 West Area Burial Grounds, WHC-EP-0645, Westinghouse Hanford Company, Richland, Washington. Wood M.I., R. Khaleel, P.D. Rittmann, A.H. Lu, S.H. Finfrock, T.H. De Lorenzo, and D.Y. Garbrick, 1996, Performance Assessment for the Disposal of Low-Level Waste in the 200 East Area Burial Grounds, WHC-SD-WM-TI-730, Westinghouse Hanford Company, Richland, Washington.

Response Letters to L105

Comments	Response
6	The waste acceptance criteria for the MLLW disposal trenches are set so that any leachate will meet the waste acceptance criteria of ETF. The sentence has been deleted.
7	The use of ERDF is being considered as an alternative in the revised draft.
8	Cumulative impact discussion of air quality impacts is included in Section 5.14. This discussion includes the contribution of the waste treatment plant based upon its current design. Should the design change then appropriate review of environmental documentation for the WTP would occur.
9	The basis for this statement is found in the main conclusions on groundwater impacts from Low-Level Waste Management Areas 1, 2, 3, and 4 in Sections 2.8 and 2.9 of the Hanford Site Groundwater Monitoring for Fiscal Year 2001 (Hartman et al. 2002), which contain the eight LLBGs in question. Based on results of fence line monitoring of the WMAs, the current interpretation is there is no evidence that the specific WMAs in question have contributed to contaminants found in groundwater underlying these areas. Section 5.3 and Appendix G do evaluate the potential for contaminants from the LLBGs to reach the groundwater in the future.
10	The engineering basis and supporting data and information can be found in Focused Feasibility Study of Engineered Barriers (DOE/RL 1996).
11	DOE has evaluated additional alternatives to better limit contaminant migration, including alternatives for the disposal of LLW in lined trenches. Additonal discussion of mitigation measures is included in Section 5.18.
12	DOE has evaluated additional alternatives to better limit contaminant migration, including alternatives for the disposal of LLW in lined trenches. Additonal discussion of mitigation measures is included in Section 5.18.
13	DOE has evaluated capping of the LLBGs upon closure to limit contaminant migration. This waste will ultimately go through a CERCLA or RCRA past-practice remedial action process prior to closure of the LLBGs. Additonal discussion of mitigation measures is included in Section 5.18. The best available information on waste form and characteristics is used regardless of waste classification. Groundwater/vadose zone modeling reflects these forms and characteristics as described in Section 5.3 and Appendix G.
14	Retrieval of TRU waste from the LLBGs has already started. Shipment of TRU waste to WIPP has also started. Over one third of the TRU waste in the LLBGs is scheduled to be retrieved by 2006 (Hanford Performance Management Plan [HPMP] DOE 2002?).

Response Letters to L105

Comments	Response
14	Retrieval will be completed before the end of the operational period. No substantial releases are expected to occur before the waste is retrieved.
15	Transuranic radionuclides are generally not mobile. Other radionuclides that may be mobile and long-lived can be found mixed with TRU radionuclides. TRU waste is a very small volume (less than 2%) when compared to the overall volume of waste already disposed of in the LLBGs. TRU waste is discussed in Section 2. of this HSW EIS.
16	DOE and NRC guidelines require a 1,000-year evaluation. The HSW EIS evaluates impacts for at least 10,000 years.
17	The analysis was done as suggested by the comment. The hypothetical wells discussed in this HSW EIS are the modelled points of maximum concentration over time along lines approximately 1 km down gradient from the overall waste disposal facilities in the 200 East Area, 200 West Area, and ERDF, and along a line near the river. These hypothetical wells are not intended to represent existing or planned locations of monitoring wells. Section 5.3 and Appendix G have been revised to clarify this. The model does not assume that near-river locations are diluted by Columbia River water. Therefore, the outcome represents undiluted concentrations in the groundwater.
18	Discussion of the synergistic effects among organic and inorganic contaminants has been added to Section 5.3 and Appendix G. To establish the relative mobility of each contaminant, they were grouped based on their mobility in the vadose zone and underlying unconfined aquifer. Contaminant groupings were used, rather than the individual mobility of each contaminant, primarily because of the uncertainty involved in determining the mobility of individual constituents. The groups were selected based on relatively narrow ranges of mobility, and constituents were placed in the more mobile group uncertainty was present concerning which group they should be placed in. Some of the constituents, such as iodine and technetium, would move at the rate of water whether in the vadose zone or underlying groundwater. The movement of other constituents in water, such as americium and cesium, would be slowed or retarded by the process of sorption onto soil and rock.

Response Letters to L105

Comments	Response
19	These data are based on site-specific analysis of adsorption and are consistent with general observations of contaminant mobility at Hanford. The HSW EIS benefited from preceding analyses and field observations, including the performance assessments for 200 West and 200 East post-1988 burial grounds (Wood et al. 1995, 1996), the remedial investigation and feasibility study of the ERDF (DOE 1994b), the disposal of ILAW originating from the single- and double-shell tanks (Mann et al. 1997) and (DOE/ORP 2001), and the Composite Analysis of the 200 Area Plateau (Kincaid et al. 1998). These and other analyses, (for example, environmental impact statements) included development of inventory data and application of screening or significance criteria to identify those radionuclides that could be expected to significantly contribute to either the dose or risk calculated in the respective analysis. The radionuclides identified as potentially significant in these published analyses are also expected to be key radionuclides in this assessment.
20	See Response 15.
21	The assumption is a conservative departure from the actual properties of the waste. The soil-debris model takes no credit for any containment of waste disposed of before 1988. For containerized waste disposed of after 1988, credit is taken for the containers only through the operating period. After the operational period is complete, it is assumed no containers would limit contaminant migration. The actual waste would likely have a lower surface-area-to-volume ratio than soil because of the form of the waste. This results in the model assuming a higher release rate than would be actually observed. In the first draft HSW EIS, two separate solubilities of uranium were used: 1) 200 mg/L for release of uranium in non-cemented wastes, and 2) 0.2 mg/L reflective of a lower solubility expected for uranium within cemented wastes. In the updated analysis, the solubility used for non-cemented wastes was lowered to 64 mg/L to be more consistent with estimates used in Wood et al. (1995 and 1996). The current estimates of uranium solubility are conservative theoretical estimates based on Hanford-specific studies.
22	The analysis has been updated to take into account cap degradation. No guidance is available for specifying barrier performance after its the design life. However, it is likely that this specific barrier will perform as designed far beyond its design life. In the case of the modified RCRA, Subtitle C, cover, which has a design life of 500 years, the starting infiltration rate used in the release modeling begins at 0.01 cm/yr, after which the assumed rate increases stepwise in five equal steps over 500 years after the start of cover degradation (See Figure G.6).

Response Letters to L105

Comments	Response
	After 500 years of degradation, the infiltration rate used in the release modeling is assumed to be equivalent to the rate used to represent recharge for the natural surrounding environment (0.5 cm/yr). This rate was used during the remaining 9,000 years of this assessment.
23	Existing groundwater contamination is largely the result of past liquid disposal practices, leakage from liquid waste storage tanks, and other liquid spills. Groundwater impacts from Low-Level Waste Management Areas 1, 2, 3, and 4 are discussed in Sections 2.8 and 2.9 of the Hanford Site-Groundwater Monitoring for Fiscal Year 2001 (Hartman et al. 2002), which contain the eight LLBGs in question. Based on results of fence line monitoring of the WMAs, the current interpretation is there is no evidence that the specific WMAs in question have contributed to contaminants found in groundwater underlying these areas. Section 5.3 and Appendix G do evaluate the potential for contaminants from the LLBGs to reach the groundwater in the future. The HSW EIS evaluates alternatives for the disposal of waste in the 200 East and 200 West Areas. See Section 3 for a description of those disposal alternatives. See Section 5 for a discussion of the potential impacts of those alternatives.
24	This information is described in the supporting Technical Information Document (HNF-4755, FH 2002). In reality, this 500-year delay in releases has little bearing on the estimated concentrations for the most long-lived constituents evaluated in the long term.
25	This part of inventory represents less than 0.01 percent of the total inventory in Group 1 constituents.
26	Existing groundwater contamination is largely the result of past liquid disposal practices, leakage from liquid waste storage tanks, and other liquid spills. Groundwater impacts from Low-Level Waste Management Areas 1, 2, 3, and 4 are discussed in Sections 2.8 and 2.9 of the Hanford Site-Groundwater Monitoring for Fiscal Year 2001 (Hartman et al. 2002), which contain the eight LLBGs in question. Based on results of fence line monitoring of the WMAs, the current interpretation is there is no evidence that the specific WMAs in question have contributed to contaminants found in groundwater underlying these areas. Section 5.3 and Appendix G do evaluate the potential for contaminants from the LLBGs to reach the groundwater in the future. Besides inventory, the key associated include estimates of infiltration, hydraulic properties, and constituent mobility properties, which in the case of this assessment is the distribution coefficient (kd). The current version of the sitewide model relies on a three-dimensional representation of the aquifer system that was calibrated to Hanford sitewide groundwater monitoring data collected during Hanford operations from 1943 to the present. The calibration procedure and results for this model are described in

Response Letters to L105

Comments	Response
	Cole et al. (2001a). This recent work is part of a broader effort to develop and implement a stochastic uncertainty estimation methodology in future assessments and analyses using the sitewide groundwater model. (Cole et al. 2001b) Resulting distribution of hydraulic conductivities from this recent calibration effort is provided in Figures G.11 and 12 in Appendix G of the revised draft HSW EIS. The assessment benefits from preceding analyses and field observations including the performance assessments for 200 West and 200 East post-1988 burial grounds (Wood et al. 1995, 1996), the remedial investigation and feasibility study of the ERDF (DOE 1994b), the disposal of ILAW originating from the single- and double-shell tanks (Mann et al. 1997) and (DOE/ORP 2001), and the Composite Analysis of the 200 Area Plateau (Kincaid et al. 1998).
27	Accumulation of contaminants and resulting impacts to biota are expected to be small. See Section 5.5 and Appendix I. Impacts to down-river populations are expected to be small. See Section 5.11 and Appendix F. The exposure scenarios described in Appendix F consider direct and indirect use of the Columbia River water and biota (e.g., swimming, consumption of fish).For those contaminants that will reach the Columbia River, the magnitude of dilution by river water is far greater than their CF meaning that they do not accumulate in the ecological system. However, the concentration of contaminants in the river is so low, the amount of accumulation of contaminants in biota is expected to be small. Dilution in the river results in less contaminants being available per unit time. The amount of time to concentrate contaminants in biota to substantial levels is longer than the life of the biota.
28	See Response 27.
29	See Response 27.
30	An analysis using the System Assessment Capability (SAC) has been added to help address the cumulative impacts of past, present, and reasonably foreseeable future impacts to the groundwater. See Section 5.14 and Appendix L. DOE recognizes the concerns of Native Americans are greater than the archaeological-anthropological type of impacts addressed in Section 5.7 and Appendix K. Impacts of other cultural aspects of Native Americans are addressed throughout the EIS (e.g., aesthetic impacts, noise, access, land use restrictions). As described in the Hanford Comprehensive Land-Use Plan Environmental Impact Statement, the Central Plateau is expected to remain an industrial exclusive zone.

Response Letters to L105

Comments	Response
31	Clean up of the Hanford Site has been and will continue to be subject to regulatory dose requirements and ALARA (as low as reasonably achievable) principles. DOE is responsible for contamination regardless of who owns or operates the Hanford Site. Even if that responsibility was transferred to another agency in the future, the other agency would have access to all the available information that DOE has. The HSW EIS evaluates the impacts of contaminants to the groundwater (Section 5.3 and Appendix G), the Columbia River, and potential impacts to biota (Section 5.5 and Appendix I) and people (Section 5.11 and Appendix F). The cumulative dose of radiation experienced by downstream populations is addressed using the System Assessment Capability (Section 5.14 and Appendix L).
32	Potential impacts to groundwater, to biota, and to people within the next 10,000 years are described in the HSW EIS. Some impacts are expected past this time. The current version of the site-wide model relies on a three-dimensional representation of the aquifer system that was calibrated to Hanford Sitewide groundwater monitoring data collected during Hanford operations from 1943 to the present. The calibration procedure and results for this model are described in Cole et al. (2001a). See the discussion of the System Assessment Capability in Appendix L.
34	Bioaccumulation is factored into the HSW EIS analysis.
35	The impacts to downstream populations (near Richland, WA and Portland, OR) are addressed in Section 5.11 and Appendix F. Cumulative impacts to downstream populations are addressed using the System Assessment Capability (Section 5.14 and Appendix L).
36	A discussion of long-term stewardship has been added to Section 2. Active institutional controls are planned for at least 100 years after site closure. Passive institutional controls would be implemented after that time.

Form: F044

3.3.3 Intertribal Fish Commission

Draft Hanford Site Solid
(Radioactive and Hazardous) Waste
Program Environmental Impact Statement (HSW EIS)
Location: Portland Date: 7/30/02

Comment Form

United States Department of Energy

Name: (optional) Tom Miller, Columbia River Inter-Tribal Fish Commission

Address: 729 NE Oregon, Suite 200, Portland, OR 97232

Telephone: (503) 736-3598 **E-Mail:** milt@critfc.org

1 The Columbia River Inter-Tribal Fish Commission opposes the US DOE's proposal to transport & dump 70,000 truckloads of radioactive waste to Hanford. The Commission is charged with the protection & restoration of salmon & other fishery resources for our member tribes: the Nez Perce, Umatilla, Warm Springs & Yakama tribes.

2 In 1855 our member tribes exchanged by treaty w/the federal govt. lands - including those which today comprise Hanford - in return for the right to retain their salmon-based cultural & spiritual values. Our tribes have honored their promises; the federal govt. has enjoyed use of Hanford without interference.

3 In return, the federal govt. has made Hanford the most radioactively contaminated site in the Western Hemisphere. Moreover, the govt's practices threaten the promises they made to our tribes. Our member tribes have had to cope w/ toxic spills into salmon-bearing watersheds that have affected the treaty fishing resources. Transporting this new volume of nuclear waste undoubtedly increases the risk of such accidents occurring in the future. (over)

Request: ☒ **Full EIS** (includes summary) ☐ **Summary EIS** ☐ **Electronic EIS (CD)**

For further information contact:
Michael Collins, NEPA Document Manager
U.S. Department of Energy (MSIN A6-38)
Post Office Box 550, Richland, WA 99352
Fax: 509-372-1926; E-mail: solid_waste_eis_-_doe@rl.gov
Information request number: 1-800-426-4914

3 (cont) The health of the Columbia River and its watersheds — including Hanford — is essential to the tribes' and the region's salmon restoration efforts. For example, the fall chinook salmon run from the Hanford Reach is the most important fishery in the Columbia River Basin & supports important fisheries in Alaska. Importing this new volume of waste to Hanford could place this ~~secured~~ treaty-secured fishery in jeopardy.

Responses to Form F044

Comments	Responses
1	Evaluations that assume no receipt of offsite waste (the Hanford Only waste volume) have been added to the HSW EIS. Information on the potential impacts of transporting waste offsite to Hanford have been added to Section 5.8 and Appendix H. Potential impacts of disposing of waste from offsite have been added throughout Section 5 and related appendices.
2	Hanford and other production sites were used in the national defense effort that benefited all Americans. A major purpose of the activities proposed in the HSW EIS is to support the cleanup efforts that DOE is currently undertaking.
3	DOE shares your concerns for protecting the Columbia River. Analysis of alternatives assess the impacts on water quality in the Columbia River. For all waste alternatives analyzed in this HSW EIS, DOE has analyzed the movement of contaminants through groundwater to the Columbia River. In all cases, it found that the water quality of the Columbia River would be indistinguishable from the current river background levels. The concentrations of all constituent contaminants were well below benchmark maximum contaminant levels at a hypothetical well located near the Columbia River. The health impacts on downstream populations of groundwater reaching the Columbia River are discussed in Section 5.11 and Appendix F. The ecological impacts are discussed in Section 5.5 and Appendix I. The impacts of groundwater reaching the river are discussed in Section 5.3 and Appendix G. Additional discussion of uncertainties has been added to Section 3. Additional discussion of mitigation measures appears in Section 5.18. According to the Columbia River Basin Fish Contaminant Survey (U.S. Environmental Protection Agency. 1996-1998. EPA 910-R-02-006. Region 10, Seattle, Washington), contaminants contributing to the potential risks for Native Americans were PCBs (Aroclors and dioxin-like PCBs), chlorinated dioxins and furans, a limited number of pesticides (DDT and others), mercury and arsenic. These chemicals occur in the Columbia River as a result of agricultural and industrial operations (pulp and paper plants, for example) and are unlikely to be of Hanford origin. These chemicals would not exist in wastes proposed for future disposal at Hanford, or, if present, would be treated to reduce their mobility and toxicity.

3.4 Congressional and Other Governmental Comments and Responses

3.4.1 Letter from U.S. Representative David Wu

STATEMENT BY REPRESENTATIVE DAVID WU
DRAFT HANFORD SITE SOLID WASTE
ENVIRONMENTAL IMPACT STATEMENT PUBLIC MEETING
PORTLAND, OR - JULY 30, 2002

I appreciate the opportunity to comment on the Department of Energy's draft Environmental Impact Statement, and I regret that I could not be here in person this evening.

As all of you are aware, the Hanford Site is perhaps the most radioactively
contaminated facility in the United States. Based on DOE estimates, 67 of 177
underground storage tanks containing the most lethal radioactive waste have
1 leaked within miles of the Columbia River. The remaining tanks have all come
close to reaching, or exceeded, their design life. DOE estimates that 450 billion
gallons of contaminated liquid were discharged into the soil during Hanford's fifty
years of operation.

Despite the huge challenges the Northwest faces at Hanford, there is some room
for optimism. DOE is looking for ways to accelerate the cleanup and to use the
2 somewhat scarce federal dollars more efficiently and effectively. We may yet
see a stable Hanford Site within our lifetimes.

The second reason for optimism is the work of concerned citizens like you who know that the decisions we make today affect the kind of world we leave to our children tomorrow. I applaud you for taking the time to be at this meeting tonight to discuss what is perhaps the most serious public health and environmental issue facing our region.

Tonight's topic, the draft EIS relating to the transport and storage of defense
related nuclear waste at Hanford, is critical to the region. I have grave concerns
3 about moving new waste to Hanford, especially when we have not even
contained and treated the existing waste.

As we sit here tonight, there are still millions of gallons of high-level nuclear
waste sitting in aging and unreliable storage tanks. Our first priority must be to
4 remove that waste and treat it, before we even consider increasing the amount of
new waste shipped to Hanford.

5 The EIS does not demonstrate that Hanford is capable of accepting the proposed
level of new waste, nor that Hanford is capable of safely treating it over the long
6 term. For instance, the EIS proposes storing massive amounts of this new waste
in soil trenches for an unspecified period of time. Before we in the Northwest
7 consider proposals to allow an increase in the amount of waste shipped to
Hanford, DOE has an obligation to demonstrate that its treatment and disposal
proposals are safe beyond a doubt. Further there must be no lingering questions

7 (cont) about whether the cost for waste treatment and disposal takes money away from cleaning up the existing waste that currently threatens our health.

8 The risks associated with dramatically increasing the amount of nuclear waste moving across our highways must not be forgotten. The estimates of the number of shipments that have been made are staggering. Under the proposal before us, we, the residents of Oregon, would shoulder a disproportionate share of the risk of catastrophic accident. This risk is exacerbated by continued warnings about terrorists trying to acquire nuclear material. The onus must be on the Department of Energy to demonstrate that its proposal is safe, that its methods of transportation are tested, and that every contingency has been planned for. The document before us does not meet that test.

In closing, I respectfully request that, in revising its Environmental Impact Statement, the Department of Energy takes into account the concerns that I, and those of us here tonight, have voiced. I thank you for listening and I look forward to working with you on this important challenge.

Responses to Letter L081

Comments	Responses
1	This is not a comment.
2	This is not a comment.
3	DOE's cleanup efforts involve many sites nationwide. Part of those efforts include consolidating waste disposal in the interests of human and environmental safety, security, and reduced costs. Hanford both receives waste from other DOE sites and sends waste to other DOE sites. While Hanford receives low-level waste and mixed low-level waste from other DOE generators, Hanford and other DOE generators send transuranic waste to the Waste Isolation Pilot Project in New Mexico for disposal. Plans are for Hanford and other DOE generators to send spent nuclear fuel and high-level waste to Yucca Mountain, Nevada.
4	Not a comment.
5	This HSW EIS evaluates environmental impacts from various forecast waste quantities that include only Hanford generated waste, in addition to varying amounts of offsite waste. The inclusion of a Hanford Only volume provides an evaluation of a scenario in which no offsite waste would be received. Long-term storage of waste, as opposed to disposal, is not proposed in any alternative, except for the No Action Alternative, which is required to be evaluated under the NEPA regulations.
6	DOE has evaluated the potential environmental impacts associated with proposals to manage various quantities of waste at Hanford. The results of the analysis are in Section 5 of this HSW EIS.
7	Waste treatment and disposal actions will contribute to cleaning up the site. Money would not be diverted from cleaning up existing onsite waste.
8	The impacts of transporting waste to and from Hanford through the states of Oregon and Washington are included in Section 2.2.4, Section 5.8, and Appendix H in Volumes I and II of this HSW EIS. The analysis is consistent with the approach used to evaluate onsite transportation impacts and makes the necessary adjustments to model the route-specific shipping distances and population data for the two primary routes through Washington and Oregon in which the shipments will travel. Offsite shipments of LLW, MLLW, and TRU waste can be conducted safely without exposing the public and environment to undue risks. This is ensured by a number of means that emphasize preventing releases of radioactive and hazardous material in transit including appropriate packaging, route selection, communications, vehicle safety, and driver training. In addition, in the unlikely event that an accidental release occurs, DOE provides the necessary support to local first responders to effectively mitigate, clean up, and monitor potential releases as well as provide medical treatment to people exposed to radiation.

Responses to Letter L081

Comments **Responses**

The DOE has several programs in place to assist State and local first responders. For example, the Radiological Assistance Program provides trained personnel and equipment to evaluate, assist, and advise in the mitigation and monitoring of radiological incidents. Part of the RAP is a network of eight Regional Coordinating Offices across the country that is staffed 24 hrs per day 365 days per year. The staff are trained to provide field monitoring, sampling, decontamination, communications, and other services as requested. In addition, DOE's Radiological Emergency Assistance Center/Training Site (REAC/TS) focuses on providing rapid medical attention to people involved in radiation accidents. REAC/TS is available 24 hours per day to provide personnel and deployable equipment to State and local emergency personnel for the treatment of radiation exposure.

In response to comments, DOE included a discussion of the potential impacts of acts of sabotage or terrorist attacks in Appendix H of the EIS.

3.4.2 Letter from U.S Representative Jim McDermott

COMMITTEE ON THE BUDGET
COMMITTEE ON WAYS AND MEANS
SUBCOMMITTEE ON HEALTH
SUBCOMMITTEE ON HUMAN RESOURCES

JIM McDERMOTT
7TH DISTRICT, WASHINGTON

Congress of the United States
House of Representatives
Washington, DC 20515

CO-CHAIRMAN
CONGRESSIONAL CAUCUS ON INDIA AND INDIAN AMERICANS

CHAIRMAN
CONGRESSIONAL TASK FORCE ON INTERNATIONAL HIV AIDS

Statement of U.S. Representative Jim McDermott
On U.S. Department of Energy's
Hanford Site Solid Waste Environmental Impact Statement
(HSSWEIS)
And Plan to Designate Hanford a National Radioactive Waste Dump

August 7, 2002

1 In pursuit of nuclear weapons production our federal government made Hanford the most contaminated land area in the hemisphere. The legacy of nuclear weapons production includes increasing contamination entering the Columbia River, risks from explosive and flammable radioactive wastes stored or buried, and 54 million gallons of High-Level Nuclear Waste stored in tanks. Much of that contamination occurred in recent decades as the U.S. Department of Energy (USDOE) claimed exemption from independent external environmental regulation.

2 Under the Hanford Clean-Up Agreement, our nation is now spending more than one and a half billion dollars a year to cleanup Hanford. But instead of honoring that commitment, the Bush Administration released plans earlier this year to leave radioactive waste in many of the High-Level Nuclear Waste tanks that already have leaked more than one million gallons of waste – waste which is moving through the soil and groundwater to the Columbia River.

3 One of the new national "goals" adopted by the Bush Administration in its "Review" of the cleanup program on February 4th, and in the Hanford implementation plan released on May 1st, is to make Hanford a national radioactive waste dump for radioactive low-level waste, radioactive wastes mixed with hazardous chemical wastes ("Mixed Wastes") and Trans-uranic wastes (often containing Plutonium, some of which is also mixed with toxic hazardous wastes).

4 The Bush Administration improperly adopted these goals without considering the impacts of the plans on our health, on the health of future generations using the Columbia River and Hanford

1035 LONGWORTH BUILDING
WASHINGTON, DC 20515-4707
(202) 225-3106

http://www.house.gov/mcdermott
PRINTED ON 100% RECYCLED PAPER

1809 7TH AVENUE, SUITE 1212
SEATTLE, WA 98101-1399
(206) 553-7170

p.2 Aug 22 02 08:21p

Reach National Monument and on the environment. The Hanford
4 (cont) Site Solid Waste EIS is supposed to fully disclose the impacts of
these plans, show the cumulative impacts from related disposal and
storage decisions, and compare reasonable alternatives. In
addition, public, state and tribal comments are to be considered
before a decision is taken.

Every day, the USDOE dumps radioactive waste in unlined soil
trenches at Hanford. USDOE continues to claim that its practices of
dumping low-level radioactive waste, some of it as radioactive as
High-Level Nuclear Waste, in unlined trenches is exempt from our
5 national and state hazardous waste disposal laws. It is time to
make it clear that USDOE's disposal of its radioactive wastes is
subject to the same environmental standards that govern
commercial radioactive and hazardous waste disposal practices. But
instead of calling for an end to DOE's current practice, this EIS
presents a preferred alternative to use unlined soil trenches to dump
an additional 12 million cubic feet of radioactive waste directly into
the soil. The EIS has no alternative to use of unlined soil trenches
6 with no leachate collection. The EIS includes no discussion of the
lack of a legally compliant groundwater monitoring system around
7 these low-level waste burial grounds.

There have been several commitments to Congress by USDOE
to begin to subject USDOE's radioactive waste practices to
8 regulation. For several years, the Hanford Advisory Board has
advised that USDOE consider the benefits of independent regulation
as a reasonable alternative in the pending HSSWEIS. To meet the
requirements of the National Environmental Policy Act (NEPA),
9 USDOE must fully consider this alternative, including whether it will
require congressional action.

The Bush Administration's plan would ship 70,000 truckloads of
radioactive waste to Hanford through Washington and Oregon –
through the Portland area, the Columbia Gorge or the treacherous
10 Blue Mountain passes. The USDOE has failed to consider the impacts
of shipping those wastes along these routes, and it has not disclosed
in the EIS the specific waste streams that would be sent to Hanford
or the specific risks and hazards from different chemical and
radioactive waste mixtures on trucks along these routes. The EIS
needs to be withdrawn and redone from scratch to disclose the
11 specific wastes proposed for shipment to Hanford and to justify why
there are no better environmental alternatives for each waste
stream, including alternatives of waste reduction, increased

Aug 22 02 08:21p p.3

11 (cont) treatment, and availability of a regulated, lined disposal facility with
leachate collection in Utah.

Under Washington State's hazardous waste laws, it is illegal to
create a hazardous waste landfill for waste from anything other than
12 the cleanup of Hanford. I do not intend to allow USDOE to ignore
our state's environmental laws. Instead, I urge an immediate
investigation under those laws of the contamination spreading from
hazardous wastes improperly disposed in the unlined burial grounds.

The fact that the Bush Administration had adopted plans to
ship waste with deadly Plutonium to Hanford, along with specific
schedules to begin those shipments was revealed only through a
Freedom of Information Act request from a watchdog group. There
is no justification to send Remote Handled and Mixed Hazardous
13 Trans-uranic wastes to Hanford. There are no safe and permitted
facilities at Hanford to treat the most radioactive Transuranic wastes
that are spreading contamination through the soil now. Yet, as
reported by the P-I, internal documents reveal that USDOE makes
receipt of offsite Transuranic waste a " higher priority" than the
Hanford Cleanup Agreement workscope. This plan threatens all of
the Northwest and we must work together as a region to stop it.

I am opposed to the Bush Administration's scheme to abandon
vitrification of the wastes in Hanford's High-level Nuclear Waste
14 Tanks. The goals adopted by the Bush Administration include not
vitrifying 75% of these wastes. Yet, the EIS fails to disclose the
very significant impacts to groundwater and to the ability of future
generations to use the hundreds of square miles of the Hanford site,
including the Hanford Reach National Monument, if these wastes are
simply mixed with cement and left in tanks or disposed in the burial
grounds.

The Bush Administration Plan would put 70,000 potential
traveling terrorist targets on our region's roads. Every truck
carrying radioactive waste through our communities is a potential
15 terrorist target. USDOE contractors shipping wastes have mislabeled
wastes, and wastes have arrived with surface contamination. We
need to cleanup Hanford, not send 70,000 truckloads to contaminate
Hanford. USDOE needs to withdraw this EIS and reissue it for public
comment after refocusing it on cleaning up Hanford's contaminated
wastes, not adding more. I urge citizens and Members of Congress
from across our region to unite to stop these dangerous plans to
make Hanford a national radioactive waste dump.

Responses to Letter L082

Comments	Responses
1	Thank you for your statement.
2	Thank you for your statement.
3	The U.S. Department of Energy's (DOE's) cleanup efforts involve many sites nationwide. Part of those efforts include consolidating waste disposal in the interests of human and environmental safety, security, and reduced costs. Hanford both receives waste from other DOE sites and sends waste to other DOE sites. While Hanford receives low-level waste (LLW) and mixed low-level waste (MLLW) from other DOE generators, Hanford and other DOE generators send transuranic waste to the Waste Isolation Pilot Project (WIPP) in New Mexico for disposal. Plans are for Hanford and other DOE generators to send spent nuclear fuel and high-level waste to Yucca Mountain, Nevada. The initial Waste Management Programmatic Environmental Impact Statement (WM PEIS) decisions related to LLW, MLLW, and TRU waste were issued between January 1998 and February 2000. The WM PEIS was an evaluation of DOE nationwide waste management, and DOE determined there was sufficient information to make programmatic decisions regarding the sites that were suitable for waste management missions. The *Hanford Site Solid (Radioactive and Hazardous) waste Program Environmental Impact Statement* (HSW EIS) evaluates alternatives consistent with the WM PEIS decisions at Hanford, and does not repeat the nationwide comparison of impacts across DOE sites contained in that document. A discussion of the WM PEIS and its relationship to the HSW EIS can be found in Section 1.5. The impacts of implementing various waste management alternatives at Hanford are discussed in Sections 3 and 5 of this HSW EIS, and include all impact analyses required under the National Environmental Policy Act (NEPA). Cumulative impacts are addressed in Section 5.14 and Appendix L. Comments received from the public, State, and Tribes were considered in preparing this revised draft of the HSW EIS, and comments from public review of the revised draft will be considered in preparing the final EIS and the Record(s) of Decision. In this revised draft HSW EIS we have substantially expanded cumulative impacts disucsion. Please see Section 5.1.4 and Appendix L of revised drat and response 3.
4	See response 3.
5	Radioactive mixed waste containing hazardous components is disposed of in lined facilities at Hanford that are regulated by and are compliant with RCRA requirements and State Dangerous Waste Regulations. Disposal of LLW in unlined trenches is authorized by the Atomic Energy Act (AEA) of 1954 and is practiced at commercial sites such as the US Ecology site, which is licensed by the State of Washington. This

Responses to Letter L082

Comments **Responses**

EIS analyzes additional alternatives that propose the disposal of LLW in lined disposal facilities with leachate collection systems that meet RCRA substantive requirements. See Section 3 in this HSW EIS for a description of alternatives.

6 This HSW EIS has been revised to address a larger number of alternatives, including alternatives for the disposal of LLW in lined trenches. DOE is considering moving exclusively to burial of LLW and MLLW at Hanford in lined facilities with leachate collection systems. See Section 3 in this HSW EIS for a description of alternatives.

7 Groundwater monitoring is conducted as part of an integrated program according to DOE Orders, the RCRA permit, and TPA requirements for the disposal areas, and will be expanded as necessary according to agreements between DOE and regulatory agencies to support future waste management operations.

8 As noted in Section 6 of this HSW EIS, a number of DOE radioactive and radioactive mixed waste activities are subject to external regulation or oversight. The specific authorities of DOE under the Atomic Energy Act (AEA) of 1954, and the application of other external requirements to DOE activities, are established by Congress rather than by DOE.

DOE is subject to external oversight through the application of many regulations, including the applicable requirements of CERCLA, RCRA, and State of Washington Dangerous Waste Regulations.

It is not clear that external regulation of facility safety and worker protection at DOE sites would result in greater public or worker safety. For example, the Occupational Safety and Health Act (OSHA) has identified a number of safety and health hazards for which DOE currently enforces more protective safety and health standards than OSHA. Also, it is not clear whether safety practices would materially change. For example, DOE worker protection requirements currently incorporate many OSHA occupational safety standards. One of the conclusions in a 1999 NRC report (*External Regulation of Department of Energy Nuclear Facilities: A Pilot Program*, NUREG-1708) covering three pilot external regulation efforts of DOE facilities was that "few, if any changes in facilities, procedures, drawings, calculations, administrative process controls, safety programs, and safety documentation (including safety analysis reports) would be necessary. DOE initiatives such as WorkSmart Standards and Integrated Safety Management Systems could continue to be used under an NRC regulatory framework."

A change to external regulation of facility safety and worker protection at DOE sites would require Congressional action including amendment of the AEA and OSHA.

DOE has added alternatives that include disposal of LLW in lined trenches with leachate collection systems that meet RCRA and State substantive requirements.

Responses to Letter L082

Comments	Responses
9	See response 8.
10	The impacts of transporting waste to and from Hanford through the states of Oregon and Washington are included in Section 2.2.4, Section 5.8, and Appendix H in Volumes I and II of this HSW EIS. The analysis is consistent with the approach used to evaluate onsite transportation impacts and makes the necessary adjustments to model the route-specific shipping distances and population data for the two primary routes through Washington and Oregon in which the shipments will travel. Offsite shipments of LLW, MLLW, and TRU waste can be conducted safely without exposing the public and environment to undue risks. This is ensured by a number of means that emphasize preventing releases of radioactive and hazardous material in transit including appropriate packaging, route selection, communications, vehicle safety, and driver training. In addition, in the unlikely event that an accidental release occurs, DOE provides the necessary support to local first responders to effectively mitigate, clean up, and monitor potential releases as well as provide medical treatment to people exposed to radiation. The DOE has several programs in place to assist State and local first responders. For example, the Radiological Assistance Program provides trained personnel and equipment to evaluate, assist, and advise in the mitigation and monitoring of radiological incidents. Part of the RAP is a network of eight Regional Coordinating Offices across the country that is staffed 24 hrs per day 365 days per year. The staff are trained to provide field monitoring, sampling, decontamination, communications, and other services as requested. In addition, DOE's Radiological Emergency Assistance Center/Training Site (REAC/TS) focuses on providing rapid medical attention to people involved in radiation accidents. REAC/TS is available 24 hours per day to provide personnel and deployable equipment to State and local emergency personnel for the treatment of radiation exposure. In response to comments, DOE included a discussion of the potential impacts of acts of sabotage or terrorist attacks in Appendix H of the EIS.
11	DOE has elected to prepare a revised draft of the HSW EIS to accommodate disposal of ILAW, in addition to new waste management alternatives under consideration since the first draft was issued in April 2002. This HSW EIS analyzes additional alternatives that include mitigation measures such as liners, leachate collection systems, a lined mega-trench, ranges of waste volumes, and capping. This EIS includes additional alternatives for disposal of LLW, MLLW, immobilized low-activity waste (ILAW), and Waste Treatment Plant (WTP) melters in either independent or combined-use facilities that would comply with RCRA and state standards for disposal of hazardous wastes. A number of locations for the facilities are considered, including the ERDF. This EIS also evaluates various forecast waste quantities that include only Hanford generated waste, in addition to various amounts of offsite waste. This evaluation reflects the uncertainty in

Responses to Letter L082

Comments	Responses
	waste quantities that Hanford might receive under the WM PEIS decisions for MLLW, LLW, and TRU waste. The inclusion of a Hanford Only waste volume provides the basis for determining the incremental impacts of offsite waste and the impacts that would be avoided at Hanford Site if these offsite wastes were disposed of elsewhere.
12	DOE has sought to comply with applicable State of Washington hazardous waste laws and regulations. Mixed waste disposed of at Hanford since 1988 has been disposed of in accordance with Washington State Department of Ecology regulations. Hazardous components in waste disposed of before 1987 will be addressed under CERCLA or RCRA past practices.
13	DOE published a Record of Decision amendment to the WM PEIS through the Federal Register on September 6, 2002 (67 FR 56989). It described DOE's decision to ship approximately 36 cubic meters of TRU waste from two other sites to Hanford for temporary storage until it is shipped to WIPP for disposal. The Federal Register Notice provides additional details on the basis of this decision. Hanford currently has facilities to safely store this material in accordance with applicable regulations until it can be processed and certified for shipment to WIPP. This HSW EIS includes alternatives for the development of capabilities for processing and certification of this waste as well as Hanford's TRU waste and other TRU wastes from offsite. The analysis concludes that the impacts of storage, processing, and certification of this waste to human health and the environment would be small.
14	DOE has announced its intent to prepare an *Environmental Impact Statement for Retrieval, Treatment, and Disposal of Tank Waste and Closure of Single-Shell Tanks at the Hanford Site* (68 FR 1052) that will address decisions regarding alternative tank waste treatment.
15	See Response 10.

Letter: L086

3.4.3 Letter from U.S. Representative Steve March

STEVE MARCH
STATE REPRESENTATIVE
DISTRICT 15
HOUSE OF REPRESENTATIVES

CHRIS CHAPMAN
LEGISLATIVE ASSISTANT
REPRESENTATIVE STEVE MARCH
DISTRICT 15
Office Address:
900 Court St NE H-384
Salem, OR 97301
503-986-1415
Fax: 503-986-1130
Email: march.rep@state.or.us

July 30, 2002

Department of Energy
Portland Hearing

1 I and many of my constituents are highly concerned about increasing the amount of radioactive nuclear waste at the Hanford Reservation.

2 Many aspects of this endeavor, including the possible contamination of the Columbia River and the millions of users downstream from Pendleton to Astoria, are troubling.
3 The transportation of waste through Oregon and other states increases the risk to the populace.
4 Lastly, I'm particularly concerned about the burying of this nuclear waste in unlined trenches.

5 There is much concern about the three categories of waste and their quantities being considered for "disposal" at the Hanford site: low level; mixed chemical and nuclear waste; and the transuranic waste. Not knowing the amounts, the travel mode and schedule, and the mode of "disposal" are all very important aspects of this that the people of Oregon and Washington deserve to understand. The fact that this highly contaminated waste is right at Oregon's back door and directly upstream from over a million people gives me great pause.

6 There have been no adequate studies of the Hanford area and it's suitability for this additional nuclear waste, let alone that already existing at the site. At the minimum, additional study is needed. My constituents would prefer that the existing waste a Hanford be cleaned-up or removed, or in lieu of that, at least properly stored.

7 I would urge the DOE to study this issue carefully. Please look at the existing storage of waste and the radioactive plume that is already progressing towards the Columbia River and find ways of solving the existing problems rather than adding to it.

Sincerely,

Steve March

Office: 900 Court St NE H-384, Salem, OR 97301 — Phone: 503-986-1415 — Fax: 503-986-1130 — march.rep@state.or.us

Responses to Letter L086

Comments	Responses
1	This is not a comment.
2	The general result of the WM PEIS was that radioactive and hazardous wastes generated at a DOE site should be disposed of at that site unless the site was not capable of or technically able to support those actions. Those decisions included processing and disposing of Hanford Site waste on the Hanford Site and the importation of some wastes from other sites that could not adequately handle them. The HSW EIS provides the analysis of impacts to the environment from those decisions. Most of the wastes evaluated in the HSW EIS will be generated by environmental restoration activities at Hanford.
3	The *Hanford Site Solid (Radioactive and Hazardous) waste Program Environmental Impact Statement* (HSW EIS) evaluates impacts to the Columbia River and downstream populations over 10,000 years (see Sections 5.3 and 5.11 and Appendixes F and G).
4	The impacts of transporting waste to and from Hanford through the states of Oregon and Washington are included in Section 2.2.4, Section 5.8, and Appendix H in Volumes I and II of this HSW EIS. The analysis is consistent with the approach used to evaluate onsite transportation impacts and makes the necessary adjustments to model the route-specific shipping distances and population data for the two primary routes through Washington and Oregon in which the shipments will travel. Offsite shipments of LLW, MLLW, and TRU waste can be conducted safely without exposing the public and environment to undue risks. This is ensured by a number of means that emphasize preventing releases of radioactive and hazardous material in transit including appropriate packaging, route selection, communications, vehicle safety, and driver training. In addition, in the unlikely event that an accidental release occurs, DOE provides the necessary support to local first responders to effectively mitigate, clean up, and monitor potential releases as well as provide medical treatment to people exposed to radiation.
5	Radioactive mixed waste containing hazardous components is disposed of in lined facilities at Hanford that are regulated by and are compliant with RCRA requirements and State Dangerous Waste Regulations. Disposal of LLW in unlined trenches is authorized by the Atomic Energy Act (AEA) of 1954 and is practiced at commercial sites such as the US Ecology site, which is licensed by the State of Washington. This EIS analyzes additional alternatives that propose the disposal of LLW in lined disposal facilities with leachate collection systems that meet RCRA substantive requirements. See Section 3 in this HSW EIS for a description of alternatives.

Responses to Letter L086

Comments	Responses
6	Various quantities of waste and alternatives for disposal are described in this HSW EIS (see Section 3). TRU waste will be shipped to WIPP for disposal and not disposed of at Hanford. Issues concerning transportation are also discussed in this EIS. See Response 5.
7	The Hanford area has been extensively studied and determined to be suitable for disposal of DOE and commercial waste (US Ecology EIS or whatever is appropriate for the licensing of the site). The impacts of disposing various quantities and types of waste are discussed in this HSW EIS as well as previous NEPA documentation (see Section 1.5). Environmental restoration is DOE's top priority at Hanford and other DOE sites.
7a	The groundwater beneath the 200 Areas has been contaminated with radionuclides and non-radioactive chemicals because of waste management activities during past Hanford Site operations. Existing groundwater contamination is largely the result of past liquid disposal practices, leakage from liquid waste storage tanks, and other liquid spills. DOE has transferred liquids from leaking storage tanks to newer double-shelled tanks to minimize the potential for future groundwater contamination, and is preparing to treat the tank waste for permanent disposal. Groundwater contamination beneath the Hanford Site is being studied and remediated by the ongoing CERCLA program in accordance with the Tri-Party Agreement. Contaminants from solid waste disposal evaluated in this HSW EIS are not expected to reach groundwater for hundreds to thousands of years into the future. In most alternatives evaluated in this revised draft HSW EIS, the contaminants that are predicted to reach groundwater are below MCLs.

3.4.4 Letter from U.S. Congressman Earl Blumenauer

EARL BLUMENAUER
THIRD DISTRICT, OREGON

COMMITTEES
TRANSPORTATION AND INFRASTRUCTURE
SUBCOMMITTEES
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INTERNATIONAL RELATIONS
SUBCOMMITTEE
EAST ASIA AND THE PACIFIC

Congress of the United States
House of Representatives
Washington, DC 20515–3703

WASHINGTON OFFICE
1406 LONGWORTH BUILDING
WASHINGTON, DC 20515–3703
(202) 225–4811
FAX: (202) 225–8941

DISTRICT OFFICE
THE WEATHERLY BUILDING
516 S.E. MORRISON STREET
SUITE 250
PORTLAND, OR 97214
(503) 231–2300

www.house.gov/blumenauer

STATEMENT OF U.S. CONGRESSMAN EARL BLUMENAUER
US Department of Energy Hearing on
HAZARDOUS AND SOLID WASTE EIS
Portland, Oregon
July 30, 2002

1 Since my election to the United States Congress, I have twice visited the Hanford Nuclear Reservation and Hanford Reach National Monument, participated in hearings concerning clean-up, and sponsored a stakeholder forum to discuss the future of Hanford. In that time we have seen both stops and starts in the clean-up process, but we were pleased to see that plans for building a vitrification plant and dealing with the most serious threat at Hanford—tank waste—seemed to be moving forward. I found the efforts of the Office of River Protection and their primary contractors, Bechtel, to meet with my staff and I, and to get the project back on track following the cost overruns of 1999, particularly commendable. The fact that the project organizers are already pouring concrete and moving ahead with full scale construction is greatly encouraging.

2 Disposal of off-site waste at Hanford is, however, another issue altogether. While I appreciate the work the Department of Energy has done to develop its most recent Environmental Impact Statement on Hazardous and Solid Waste, I am greatly concerned that the proposals in this document will undermine the progress of Hanford clean up. The call to import half a million cubic yards of new waste to Hanford, without having developed and implemented a solution for treating and storing what is already there, is an irresponsible measure that could increase the threat of an economic and environmental disaster at Hanford.

3 Hanford currently contains two-thirds of the nation's high-level nuclear waste and contaminated soils, with the largest amount of tainted groundwater in the country. Its proximity to the Columbia River make the DOE's proposal to expand unlined soil disposal trenches for low level waste disposal seem more of a hazard than a solution.

4 Also lacking in this EIS, and of very serious concern to me, is a comprehensive analysis and plan for recovering the cost of importing and treating offsite waste at Hanford. In FY03, we will spend nearly 2 billion dollars to clean up and ensure safety and security at the Hanford site. To move forward with a plan for bringing new waste to Hanford, before we have an opportunity to implement and assess waste treatment plans for what is already on site, is not what I would consider fiscally or morally responsible.

Letter: L088

5 In addition, I am dismayed that NEPA regulations that require consultation with the Tribes and various federal and state agencies were not followed. Nor does this EIS analyze the impacts of transporting radioactive waste from outside sites to Hanford. This is of great concern for my colleagues and I who represent areas where waste could be likely to travel.

I recognize that the nation's nuclear and hazardous waste presents one challenge after another, and I commend the work of the individuals at the DOE who are committed to solving these problems so that our children will not be left to do so. It is critical, however, to remember that even the small steps moving us forward at Hanford remain overshadowed by a record of milestones not met, personnel changes, funding shortfalls, and aborted starts. Pacific Northwest citizens still fear being forced to "start over" before a single bit of the existing, on-site waste in the most contaminated site in the Western Hemisphere is treated and stored. Importing new waste to Hanford at this time could be a major setback in our efforts to achieve a timely, cost-effective, environmentally sound clean up.

GEORGE D. WARD & ASSOCIATES
ENVIRONMENTAL
CONSULTING ENGINEERS

Tel (503) 293-6075
Fax (503) 293-1268
Cell (503) 750-4651
4941 S.W. 26th Drive
Portland, Oregon 97201

GEORGE D. WARD, P.E.

Responses to Letter L088

Comments	Responses
1	The Department of Energy's cleanup efforts involve many sites nationwide. Part of those efforts include consolidating waste disposal in the interests of human and environmental safety, security, and reduced costs. Hanford both receives waste from other DOE sites and sends waste to other DOE sites. While Hanford receives low-level waste and mixed low-level waste from other DOE generators, Hanford and other DOE generators send transuranic waste to the Waste Isolation Pilot Project in New Mexico for disposal. Plans are for Hanford and other DOE generators to send spent nuclear fuel and high-level waste to Yucca Mountain, Nevada. Decisions made as part of the Waste Management Programmatic Environmental Impact Statement made Hanford available for the disposal of low-level waste and mixed low-level waste from other DOE generators. The Hanford Site Solid (Radioactive and Hazardous) waste Program Environmental Impact Statement (HSW EIS) provides the analysis of potential impacts to the environment from proposals to implement those decisions at Hanford. The information in the draft HSW EIS is limited to that needed to support environmental impact evaluations associated with the proposed action.
2	Hanford plans to send its high-level waste to Yucca Mountain. Consistent with RCRA, CERCLA, and the Tri-Party Agreement, cleanup of contaminated soils and the groundwater have been underway for ten years. Consistent with NEPA requirements, disposal of low-level waste in unlined trenches is included in the HSW EIS because it is a reasonable alternative to be evaluated. Based on public comments, additional disposal alternatives have been evaluated including disposal of low-level waste in lined trenches. There are no alternatives for disposal of mixed low-level waste in unlined trenches.
3	See response 1.
4	The U.S. Fish and Wildlife Service, the National Marine Fisheries Service, Washington State Historic Preservation Office were consulted prior to issuing the HSW EIS for public review. Many other public agencies were provided the opportunity to comment on the draft HSW EIS including the U.S. Environmental Protection Agency, the Washington State Departments of Ecology, the Washington State Department of Health, the Washington Department of Fish and Wildlife, Oregon Office of Energy, and several county and city governments. Formal requests for comments on the HSW EIS were sent to the Yakama Nation, the Confederated Tribes of the Umatilla Indian reservation, the Nez Perce, the Wanapum, and the Confederated Tribes of the Colville Reservation.

Responses to Letter L088

Comments	Responses
5	The impacts to Oregon and Washington of transporting waste to and from Hanford have been added to the HSW EIS.

3.4.5 Letter from U.S. Senator Gordon H. Smith

GORDON H. SMITH
OREGON

COMMITTEES:
BUDGET
COMMERCE
ENERGY AND NATURAL RESOURCES
FOREIGN RELATIONS

United States Senate

WASHINGTON, DC 20510–3704
July 29, 2002

The Honorable Spencer Abraham
Secretary of Energy
1000 Independence Ave., S.W.
Washington, D.C. 20585

Dear Secretary Abraham:

I am writing to express my strong concerns about the Department's Draft Hanford Site Solid Radioactive and Hazardous Waste Program Environmental Impact Statement.

1 As you know, the Hanford Nuclear Reservation, currently storing sixty percent of the nation's high-level radioactive waste, is the most seriously polluted site in the nation. I have noted before that this waste threatens the health of the Columbia River and the people and wildlife that live in the Pacific Northwest.

2 First, let me make clear that I remain opposed to any proposal that would essentially perpetuate the use of the Hanford Nuclear Reservation as a federal dump site for radioactive waste. Cleaning up – not adding to – this environmental catastrophe should be priority one for the Department of Energy and the focus of this Environmental Impact Statement. 3 For this reason, I was disappointed to learn that under the current Draft EIS, the Department is actually considering increasing shipments of off-site nuclear waste to Hanford. This proposal should not even be considered, particularly since the Department has yet to process a single ounce of the liquid waste already stored at Hanford.

4 In addition, I am concerned that the Draft EIS fails to provide a comprehensive analysis of the cumulative effect of all of Hanford's current and proposed waste storage and treatment activities on the ecosystem. For instance, the document fails to incorporate analysis or recommendations on transuranic (TRU) wastes disposed at Hanford prior to 1970.

5 Unfortunately, I must also point out that I have heard from a number of constituents that the summary document was written in a manner that was difficult for laypeople to understand and gives citizens little information that would help them analyze the proposal. 6 In addition, there have been complaints that copies of the Draft EIS were not sent even after they were requested. With a matter as serious as the future of Hanford, I believe the federal government should make every effort to ensure that interested stakeholders are fully informed of the actions being considered by the Department.

Thank you for considering my views and the views of those attending public hearings on this matter. I look forward to hearing from you soon.

Sincerely,

Gordon H. Smith
United States Senator

cc: Mr. Michael S. Collins, EIS Document Manager

www.gsmith.senate.gov
oregon@gsmith.senate.gov

PRINTED ON RECYCLED PAPER

Responses to Letter L094

Comments	Responses
1	Thank you for your statement.
2	The Department of Energy's cleanup efforts involve many sites nationwide. Part of those efforts include consolidating waste disposal in the interests of human and environmental safety, security, and reduced costs. Hanford both receives waste from other DOE sites and sends waste to other DOE sites. While Hanford receives low-level waste and mixed low-level waste from other DOE generators, Hanford and other DOE generators send transuranic waste to the Waste Isolation Pilot Project in New Mexico for disposal. Plans are for Hanford and other DOE generators to send spent nuclear fuel and high-level waste to Yucca Mountain, Nevada. Decisions made as part of the Waste Management Programmatic Environmental Impact Statement made Hanford available for the disposal of low-level waste and mixed low-level waste from other DOE generators. The Hanford Site Solid (Radioactive and Hazardous) waste Program Environmental Impact Statement (HSW EIS) provides the analysis of potential impacts to the environment from proposals to implement those decisions at Hanford. The information in the draft HSW EIS is limited to that needed to support environmental impact evaluations associated with the proposed action.
3	The purpose and need of the HSW EIS is for DOE to provide capabilities to treat, store, and dispose of varying quantities of waste which may include offsite waste. The proposed action was developed, in part, to implement decisions reached by DOE under the Waste Management Programmatic Environmental Impact Statement, the Waste Isolation Pilot Plant Supplemental Environmental Impact Statement II, and other relevant decision documents. The HSW EIS evaluates scenarios that assume no waste is received at Hanford as well as scenarios that include offsite waste. This provides a basis for comparison of the potential environmental impacts and allows DOE to make informed decisions.
4	The HSW EIS uses available data, computer modeling, assumptions, and related analytical methods to evaluate reasonably foreseeable environmental impacts of the proposed actions. The analytical approach was consistently applied to each alternative, and it provided information that allowed objective parametric evaluations of the alternatives. More cumulative impact information has been added to the HSW EIS. The scope of the draft HSW EIS does include evaluation of potential impacts from pre-1970 waste. Additional evaluations and decisions regarding these wastes will be addressed through CERCLA and RCRA past-practice processes in collaboration with EPA and Washington State Department of Ecology.

Responses to Letter L094

Comments	Responses
5	DOE has expanded the summary to include additional information and in an effort to improve readability. NEPA requires that summaries be kept brief and the details on analyses are presented in the HSW EIS.
6	Over 350 summaries and over 500 full copies of the HSW EIS were sent to interested people. There were a few individuals who expressed concern to DOE about not getting a requested copy. A second copy was sent to these individuals immediately after DOE became aware. DOE agrees that interested people should be fully informed and makes great efforts to do so.

3.5 Hanford Advisory Board Comments and Responses

HANFORD ADVISORY BOARD

A Site Specific Advisory Board, Chartered under the Federal Advisory Committee Act

July 11, 2002

Keith Klein, Manager
U.S. Department of Energy, Richland Operations
P.O. Box 550 (A7-50)
Richland, WA 99352

Roy Schepens, Manager
U.S. Department of Energy, Office of River Protection
P.O. Box 450
Richland, WA 99352

Tom Fitzsimmons, Director
Washington State Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600

John Iani, Regional Administrator
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue
Seattle, WA 98101

Re: Hanford Solid Waste Environmental Impact Statement

Dear Messrs. Klein, Schepens, Fitzsimmons, and Iani

The Hanford Advisory Board (Board) has long and anxiously awaited the issuance of the draft Hanford Hazardous and Solid Waste Environmental Impact Statement (HSW-EIS). We are pleased that it has finally been released, however we are very disappointed with the draft. The Board believes the draft is incomplete and inadequate to support proposed decisions. In addition, it was not prepared in compliance with National Environmental Protection Act (NEPA) processes. Therefore, the Board urges the current draft be withdrawn and reissued in draft form for public comment to produce an adequate EIS, based on appropriate consultation and including the scope discussed below. 1

The draft HSW-EIS assumes the 2000 Record of Decision (ROD) selecting Hanford as a specific site for disposal of Department of Energy (DOE) complex low level waste (LLW) and mixed low level waste (MLLW) was fully supported by the Waste Management Programmatic Environmental Impact Statement (PEIS) analysis. As shown by public comment on the PEIS, the states, Tribes, and other stakeholders did not find the PEIS analysis sufficient to support selection of Hanford as a disposal site 2

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Adopted: July 11, 02

EnviroIssues Hanford Project Office
1933 Jadwin Suite 135
Richland WA, 99352
509-942-1906
FAX 509-942-1926

for DOE complex-wide waste. As an example, a comprehensive, integrated,
2 publicly vetted strategy for all nuclear materials disposition for the complex is
(cont.) needed to support the PEIS. The PEIS ROD was issued before preparation and
public review of the Hanford draft HSW-EIS, which should evaluate the site-specific
impacts of such disposal.

3 What was expected from this HSW-EIS was: 1) an understanding of impacts of past
and continued waste disposal at Hanford; 2) comparison of LLW/MLLW disposal at
4 different sites; 3) comparison of Hanford-only versus off-site waste; 4) the scope of
all previously buried and newly-generated solid waste; 5) discussion on long-term
5 management; 6) a range of treatment alternatives for radioactive and hazardous
6 constituents and disposal options; 7) short and long-term impact assessments to
7 ecology; and 8) significant differences between low and high volumes impact
8 assessments.

The HSW-EIS should integrate all waste site analyses to determine the full cumulative impacts.

The cumulative impacts of related major actions, on site and complex-wide, are not
adequately addressed in the draft HSW-EIS. The draft frequently incorporates other
9 documents by reference only. In addition, the Board questions the consistency of the
draft HSW-EIS with the PEIS. In order for the HSW-EIS to be a credible, bounding
document, it must show how much waste in all forms Hanford is slated to keep. It
should also state how much will be exported and how much new waste will be
accepted.

Additional analysis is needed.

The Board believes the draft HSW-EIS lacks sufficient analyses to support related
DOE-proposed decisions. These include the import and burial of low level and
10 mixed low level waste, proposed expansion of unlined soil disposal trenches for low
level waste, import of transuranic wastes (TRU), and the lack of plans to retrieve or
mitigate the impacts from TRU waste buried before 1970. DOE intends to make
final decisions on each of these issues within six months, following the adoption of
the ROD based on the HSW-EIS. The inadequacy of the draft understandably
concerns the Board.

Board finds the necessary changes to the draft document are significant.

11- The following numbered items (in no specific order of priority) identify examples of
33 where the draft HSW-EIS is incomplete, inadequate, or excludes items that need to
be addressed:

11 1. Failure to include impacts and alternatives identified by the Board (provided to DOE in advice #103 and 98) during the EIS scoping process.

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12 2. Inclusion of off-site waste volumes in the draft HSW-EIS much greater than those identified during the EIS scoping period.

13 3. Lack of consultation with Tribes or other federal and state agencies, as required under NEPA and SEPA.

14 4. Failure to disclose impacts to groundwater and human health at the point of compliance for waste management units. The Board encourages the agencies to consider the recent advice from the Board reflecting input from the Exposure Scenarios Task Force (consensus advice #132). The point of compliance should ensure no further degradation to ground water beyond the edge of the waste management unit. Non-degradation is required under both state and federal regulations. Without explanation, and in apparent violation of applicable standards, the EIS provides only a partial description of groundwater impacts for a single well one kilometer away from the burial grounds.

15 5. The draft HSW-EIS improperly asserts a claim for irretrievable and irreversible impact to an unidentified area of ground water (which may encompass the entire Hanford site) forever, with no analysis or disclosure of how large an area this may be, how bad the conditions may become, or how long this may persist.

16 6. Inadequacy of NEPA assessment for endangered species.

17 7. Modeling and inventory assumptions are not explained and appear inconsistent with known data on the movement of radioactive and hazardous waste at Hanford, and are also inconsistent with other site actions.

18 8. Failure to include a true "No Action" alternative that does not import and bury offsite-generated LLW and MLLW from DOE sites and other generators. The current "No Action" alternative (as noted on page S-3, line 27-30) does not comply with legal or regulatory requirements.

19 9. Failure to include reasonable alternatives to the proposed actions, especially the failure to include an alternative to end the use of unlined soil trenches for disposal.

20 10. Failure to integrate and consider the cumulative impact of all Hanford waste decisions, the impact of these decisions on this EIS, and the conclusions from this EIS in those decisions. The estimated risks proposed by this action are only a small portion of the total risks posed by all site actions and should be communicated. This is exemplified by the failure to disclose and consider the cumulative impacts of wastes already disposed to the soil and proposed Performance Management Plan (PMP) actions to dispose of additional wastes to the soil (e.g. proposed actions to dispose of some wastes from Hanford's high-level waste tanks in the soil).

21 Additionally, the Board urges DOE to end the use of unlined soil trenches without leachate collection systems for disposal of wastes.

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22 11. Accident analysis must include malevolent events.
12. The Board is concerned the programmatic issue of the cumulative and
23 route-specific effects of transporting wastes from multiple sites to
Hanford has not been addressed.
13. The Board is concerned the facilities required for treating remote handled
24 TRU waste as required in the Tri Party Agreement (TPA) Milestone 91
have been delayed, and the impacts from delayed or lesser TRU waste
retrieval, as well as the impacts of importing TRU have not been
considered in this draft HSW-EIS.
25 14. Waste from high level tanks that may be disposed in soil and disposition
of K-Basin sludge should be included.
15. Cumulative impacts of reactor components disposal, including naval
26 reactor compartments, should be included.
27 16. Pre-1970 TRU waste in the burial grounds should be addressed.
17. The impacts of not retrieving or shipping to WIPP the post-1970 TRU
28 waste should be analyzed.
29 18. There is inadequate analysis of cap performance. The draft HSW-EIS
considers only one cap, and assumes it meets RCRA requirements.
19. There is no analysis to support the draft document cover letter assertion
30 that use of deep lined "megatrenches" is bounded by the analysis
performed for shallow trenches in the draft HSW-EIS.
31 20. Long term stewardship considerations are not evident.
21. The draft HSW-EIS lacks inclusion of Environmental Restoration waste,
32 which was excluded from analysis in the PEIS.
22. The impacts of hazardous waste buried with various forms of radioactive
33 waste (e.g. lead shielding) should be analyzed.

Currently disposed waste needs detailed analysis.

The Board has previously urged that DOE stop disposing of offsite wastes in the low
level waste burial grounds (LLBG) until they are fully investigated for disposal of
34 hazardous or dangerous wastes (including liquids, flammables, solvents, etc.) and for
releases of hazardous substances (consensus advice # 98 and #103). It is vital that
the groundwater monitoring around the burial grounds be substantially upgraded and
35 vadose zone monitoring be instituted as part of this investigation. Many of the wells
are dry, or soon will be, and the burial grounds lack any leachate monitoring and
collection system.

The Board urges the State of Washington to exercise its authority over the burial
grounds as dangerous waste management units to meet leachate collection standards,
36 and to prevent the addition of several hundred thousand cubic meters of offsite waste
to unlined soil trenches, as proposed in the draft HSW-EIS and the PMP. The Board
has previously provided advice that the LLBGs should be independently regulated,

36 (cont) and that the draft HSW-EIS should consider the benefits of independent external regulation of the LLBGs as a reasonable alternative (consensus advice #98).

Full cost of imported waste must be recovered.

37 The Board repeats its advice that the HSW-EIS considers the impacts on Hanford Cleanup from the costs of offsite waste (see consensus advice #79, #84, and #94). Charging generators the long-term, fully burdened costs of disposal (and treatment or storage), as the Board has advised (see consensus advise # 98), would encourage treatment and reduction in waste volumes. It would also reduce the impact of offsite waste on the ability of the Hanford site to meet TPA milestones and other compliance requirements. This costing method must be considered in the HSW-EIS.

Analysis should be limited to receipt of offsite MLLW for short-term storage and treatment only.

38 The Board has issued advice (#13 and #103) that the import of mixed waste to Hanford be limited to short term storage for purposes of using available treatment capacity. (If disposal of mixed waste were limited to onsite stored forecasts to be generated, the quantity for disposal would be 14,000 cubic meters. Instead, the draft HSW-EIS considers disposal of 210,000 cubic meters.) Thus, the analysis in the HSW-EIS should be limited to receipt of offsite MLLW for short-term storage and treatment. DOE wrongly states in the PMP the MLLW burial ground is permitted for offsite waste, and proposes to issue a decision in six months to start import and disposal of offsite mixed waste. The Board urges the State of Washington to limit the MLLW burial ground permit to the quantity and types of wastes forecast from Hanford Cleanup (as has been done with the Environmental Restoration Disposal Facility landfill).

Permitting decisions should not be made based on this draft HSW-EIS.

39 The Board is concerned that permitting decisions for the Waste Receiving and Processing facility, the low level burial grounds, and the Central Waste Complex may be made without knowledge of the quantities and nature of wastes proposed to be stored, disposed, or treated. The Board urges permitting agencies not to grant any permit based solely upon the draft or the final HSW-EIS unless this issue is resolved.

Board advises draft HSW-EIS be withdrawn and reissued.

40 The Board advises the regulatory agencies find the document inadequate to meet NEPA and the Washington State Environmental Policy Act (SEPA) requirements. The Board also strongly advises DOE to withdraw and reissue the HSW-EIS following appropriate analysis and disclosure. This revision would allow the most recent budget and cost comparison data to be factored into the document.

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Adopted: July 11, 02

Sincerely,

Todd Martin, Chair
Hanford Advisory Board

This advice represents HAB consensus for this specific topic. It should not be taken out of context to extrapolate Board agreement on other subject matters.

cc: Wade Ballard, Deputy Designated Federal Official, U.S. Department of Energy
Michael Gearheard, Environmental Protection Agency
Michael Wilson, Washington State Department of Ecology
Martha Crosland, U.S. Department of Energy Headquarters
The Oregon and Washington Congressional Delegations

U.S. Senators (OR)
Gordon H Smith
Ron Wyden

U.S. Senators (WA)
Maria Cantwell
Patty Murray

U.S. Representatives (OR)
Earl Blumenauer
Peter DeFazio
Darlene Hooley
Greg Walden

U.S. Representatives (WA)
Norm Dicks
Jennifer Dunn
Richard Hastings
George Nethercutt

State Senators (WA)
Pat Hale
Mike Hewitt

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F

State Representatives (WA)
Jerome Delvin
Shirley Hankins

HAB Consensus Advice #133
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Response to Letter L083

Comments	Responses
1	The draft *Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement* (HWS EIS) has been revised and reissued for an additional opportunity for public comment. This EIS has been prepared in compliance with Council on Environmental Quality (CEQ) and National Environmental Protection Act (NEPA) requirements.
2	This HSW EIS has been revised to address a larger number of alternatives. A Hanford Only waste volume was evaluated to better show the incremental impacts to Hanford of managing waste from offsite generators. The impacts of transporting waste through Washington and Oregon are now presented. The System Assessment Capability (SAC) has been used to provide additional cumulative impact information.
3	The SAC has been used to provide additional cumulative impact information (see Section 5.14 and Appendix L).
4	A comparison of low-level waste (LLW) and mixed low-level waste (MLLW) disposal at various DOE sites was included in the Waste Management Programmatic Environmental Impact Statement (WM PEIS) and in various site-specific NEPA documents.
5	This HSW EIS evaluates a range of waste receipts at Hanford to encompass the uncertainties regarding quantities of waste that would ultimately be managed at the site. This HSW EIS now includes an evaluation of Hanford Only waste. A Hanford Only waste volume was evaluated to better show the incremental impacts to Hanford of managing waste from offsite generators.
6	See Response 3.
7	The HSW EIS now contains additional discussion and analysis on long-term management and stewardship (see Section 2.0).
8	Additional alternatives have been evaluated in this HSW EIS. Additional information on treatment technologies and disposal options has been provided in Section 2.1.
9	Information on the affected ecological environment is in Section 4.6. Potential ecological impacts are addressed in Section 5.5 and Appendix I. DOE addresses the relationship between short-tem uses of the environment and the maintenance or enhancement of long-term productivity in Section 5.16.
10	The analyses showed only small differences in impacts for the different waste volumes analyzed. These analyses and methodologies are discussed in Section 5 and its associated appendixes.
11	The SAC has been used to provide additional cumulative impact information on the Hanford Site (see Section 5.14 and Appendix L). Uncertainty in waste volumes is discussed in Section 3.0. Information on exports and imports has been added to Section 1.0. Complex-wide cumulative impact information is provided in the WM PEIS. DOE has followed CEQ requirements (40 CFR 1502.21) regarding incorporating material by reference.

Response to Letter L083

Comments	Responses
12	This HSW EIS has been revised to address a larger number of alternatives, including alternatives for the disposal of LLW in lined trenches. A Hanford Only waste volume was evaluated to better show the incremental impacts to Hanford of managing waste from offsite generators. The impacts of transporting waste through Washington and Oregon are now presented. The SAC has been used to provide additional cumulative impact information. DOE is not addressing proposals to take action to retrieve and treat pre-1970 waste in this EIS. When these proposals are made they will likely be addressed as part of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA) past practices processes, which include consideration of NEPA values.
13	In developing alternatives and analyses in this EIS, DOE has taken into account the recommendations set forth in Hanford Advisory Board (HAB) Consensus Advice 103 and 98. For example, a Hanford Only waste volume was evaluated.
14	The waste volumes in the HSW EIS Notice of Intent were for 20 years. Based on comments received during the scooping process DOE decided to evaluate Hanford waste management activities over a longer time period.
15	The U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the Washington State Historic Preservation Office were consulted prior to issuing the HSW EIS for public review. Many other public agencies were provided the opportunity to comment on the draft HSW EIS including the U.S. Environmental Protection Agency (EPA), the Washington State Departments of Ecology (Ecology), the Washington State Department of Health (WDOH), the Washington Department of Fish and Wildlife (WDFW), Oregon Office of Energy, and several county and city governments. Formal requests for comments on the HSW EIS were sent to the Yakama Nation, the Confederated Tribes of the Umatilla Indian reservation, the Nez Perce, the Wanapum, and the Confederated Tribes of the Colville Reservation.
16	As noted in the Tri-Party Agreement (TPA) agencies' response to HAB Advice 132: "We intend to fully integrate the decisions for the remediation of the source units with those for the remediation of groundwater using the appropriate regulatory process. Establishing points of compliance and remedial objectives will be done in adherence to regulations. Also, we have started an effort to evaluate groundwater technologies necessary to deploy to remediate groundwater in the core zone. This effort will be advanced through the regulatory documents and reviews of the corresponding groundwater operable units." The maximum point of impact from multiple and widely dispersed sources is not necessarily directly underneath the Low Level Burial Grounds (LLBGs) or at the LLBG boundary. To model the groundwater impacts from multiple and widely dispersed disposal units over long periods of time, a 1-km "point of analysis" location was deemed to be more appropriate and representative than a regulatory "point of compliance" well location. Current results from the RCRA-compliant groundwater monitoring have not identified any groundwater impacts from the LLBGs.

Response to Letter L083

Comments **Responses**

The point of analysis approach is considered more technically appropriate for a NEPA evaluation of groundwater impacts. More specific clarification about the differences between the "point of assessment" used in the HSW EIS groundwater impact analysis and the RCRA "point of compliance" for land disposal unit groundwater monitoring wells is provided in Section 5.3 and Appendix G.

The HSW EIS evaluates the impacts of three exposure scenarios, one of which includes a sweat lodge. These scenarios are consistent with EPA, Model Toxics Control Act (MTCA), and the Hanford Site Risk Assessment Methodology. The exposure pathways included ingestion, dermal absorption (bathing), biota, dairy, meat, game, fruit, vegetables, and inhalation. See Tables F.37 through F.4? in Appendix F. The text has been revised to more clearly explain this.

17 With regard to groundwater, this HSW EIS recognizes an existing condition that has been included as an irreversible and irretrievable commitment of resources in this and other NEPA actions. Groundwater impacts resulting from actions proposed in this HSW EIS are included in Section 5.3 and Appendix G. The groundwater models used indicate the extent, intensity, and duration of impacts to groundwater.

18 See Response 9.

19 Inventory data and assumptions are addressed in Section 3.X and Appendixes B and C. Modeling assumptions are addressed in several appendixes, including Appendix F for human health and Appendix G for groundwater.

The assessment benefits from preceding analyses and field observations, including the performance assessments for 200 West and 200 East post-1988 burial grounds (Wood et al. 1995, 1996), the remedial investigation and feasibility study of the Environmental Restoration and Disposal (ERDF) (DOE 1994b), the disposal of immobilized low-activity waste (ILAW) originating from the single- and double-shell tanks (Mann et al. 1997) and (DOE/ORP 2001), and the Composite Analysis of the 200 Area Plateau (Kincaid et al. 1998).

20 A No Action Alternative under NEPA does not necessarily mean no action at all (see CEQ Forty Most Asked Questions, Question 3, No Action Alternative [46 FR 18026]). Pursuant to the HSW EIS Notice of Intent (65 FR 10061), under the no action alternative, "DOE would continue ongoing waste management activities and implement those actions for which NEPA reviews have been completed and decisions made [the baseline for analytical purposes would be the time of issuance of the first draft HSW EIS]. The no action alternative will provide a baseline for comparison of the environmental impacts of the proposed action and its alternatives." Discussion of a "stop action" scenario has been added in Section 3.X and in Appendix O.

21 Additional alternatives are evaluated in this HSW EIS, including alternatives for the disposal of LLW in lined trenches. Descriptions of these alternatives have been added to Section 3.X.

22 The SAC has been used to provide additional cumulative impact information (see Section 5.14

Response to Letter L083

Comments	Responses
	and Appendix L).
	Some acceleration activities described in the Hanford Performance Management Plan could be implemented based on current NEPA documentation; others would require completion of this HSW EIS prior to their implementation; and still others would require further planning, changes to existing permits and TPA milestones, and preparation of additional NEPA analysis.
23	DOE is considering moving exclusively to burial of LLW and MLLW at Hanford in lined facilities with leachate collection systems.
24	The consequences of a "malevolent event" are expected to be similar to those from severe (low probability, high consequences) accidents already evaluated in this HSW EIS. The HSW EIS analyzes several accident scenarios, including fires, explosions, and earthquakes (see Section 5.11 and Appendix F). This EIS also analyzes the impacts of accidents during transportation of waste (see Section 5.8 and Appendix H).
	It is not possible to predict the probability of a malevolent event, however in general the LLW, MLLW, and TRU do not present an attractive target. The shipping containers used for transporting these materials are designed with safeguards commensurate with the potential hazard.
	In response to comments, DOE included a discussion of the potential impacts of acts of sabotage or terrorist attacks in Appendix H of this EIS.
25	Discussion of the potential impacts of waste being transported through Washington and Oregon has been added to Section 5.8 and Appendix H.
26	The completion of this HSW EIS is one of the major steps in obtaining the required treatment facilities.
	The impacts of importing TRU waste have been considered in the waste volumes analyzed in this EIS. See waste volume tables in Section 3.X and Appendix C, which identify the potential wastes to be received by Hanford.
27	This HSW EIS has been revised to include the disposal of the ILAW stream from the high-level waste treatment program.
	The *Environmental Impact Statement for Retrieval, Treatment, and Disposal of Tank Waste and Closure of Single-Shell Tanks at the Hanford Site* (68 FR 1052) will analyze other tank waste activities.
	K Basin sludge will be stored, processed, and certified onsite for shipment to WIPP for disposal. These activities are part of the alternatives evaluated in the HSW EIS.

Response to Letter L083

Comments	Responses
28	The SAC has been used to provide additional cumulative impact information. This HSW EIS takes naval reactor compartment disposal into account as part of the cumulative impacts analysis (Section 5.14 and Appendix L).
29	DOE is not addressing proposals to take action to retrieve and treat pre-1970 waste in this HSW EIS. When these proposals are made they will likely be addressed as part of the CERCLA and RCRA past practices processes, which include consideration of NEPA values. The SAC has been used to provide additional cumulative impact information (see Section 5.14 and Appendix L).
30	The alternatives in this HSW EIS assume the post-1970 retrievably stored TRU waste will be shipped to WIPP in New Mexico based on previous NEPA decisions. The long-term environmental impacts of leaving these wastes at Hanford were not evaluated in this HSW EIS because it is not expected to remain onsite. Retrieval of TRU waste from the LLBGs has already started. Shipment of TRU waste to WIPP has also started. Over one third of the TRU waste in the LLBGs is scheduled to be retrieved by 2006 (Hanford Performance Management Plan [PMP] DOE 2002). Retrieval will be completed before the end of the operational period.
31	An expanded discussion of capping options considered by DOE is included in Section 3.x. The modified RCRA Subtitle C cover is based on a RCRA-compliant design.
32	Additional alternatives are evaluated in this HSW EIS, including alternatives for the disposal of waste in deep lined mega-trenches.
33	The HSW EIS now includes an expanded discussion of long-term stewardship considerations in Sections 2.0 and 5.18.
34	Environmental restoration waste disposal is addressed as part of the cumulative impacts (Section 5.14 and Appendix L).
35	Uncertainties about hazardous chemical constituents in the previously disposed of waste are discussed in Section 3.0. This waste will ultimately go through a CERCLA or RCRA past-practice remedial action process prior to closure of the LLBGs. The HSW EIS includes potential impacts of disposing of MLLW (mixed radioactive and hazardous waste), including radioactively contaminated lead shielding. The groundwater impacts of disposal are discussed in Section 5.3 and Appendix G. The human health impacts are discussed in Section 5.11 and Appendix F.
36	In developing alternatives and analyses in this EIS, DOE has taken into account the recommendations set forth in Hanford Advisory Board (HAB) Consensus Advice 103 and 98. For example, a Hanford Only waste volume was evaluated.

Response to Letter L083

Comments	Responses
37	Groundwater monitoring and leachate collection are conducted according to the RCRA permit for the MLLW trenches, and will be expanded as necessary according to agreements between DOE and regulatory agencies to support future waste management operations. Groundwater monitoring is routinely conducted at the Hanford Site. Additional information on costs of post-closure monitoring is included in Section 3.5.
38	This comment is not directed to DOE.
39	As noted in Section 6 of this HSW EIS, a number of DOE radioactive and radioactive mixed waste activities are subject to external regulation or oversight. The specific authorities of DOE under the Atomic Energy Act (AEA) of 1954, and the application of other external requirements to DOE activities, are established by Congress rather than by DOE. DOE is subject to external oversight through the application of many regulations, including the applicable requirements of CERCLA, RCRA, and State of Washington Dangerous Waste Regulations. It is not clear that external regulation of facility safety and worker protection at DOE sites would result in greater public or worker safety. For example, Occupational Safety and Health Act (OSHA) has identified a number of safety and health hazards for which DOE currently enforces more protective safety and health standards than OSHA. Also, it is not clear whether safety practices would materially change. For example, DOE worker protection requirements currently incorporate many OSHA occupational safety standards. One of the conclusions in a 1999 NRC report ("External Regulation of Department of Energy Nuclear Facilities: A Pilot Program," NUREG-1708) covering three pilot external regulation efforts of DOE facilities was that "few, if any changes in facilities, procedures, drawings, calculations, administrative process controls, safety programs, and safety documentation (including safety analysis reports) would be necessary. DOE initiatives such as WorkSmart Standards and Integrated Safety Management Systems could continue to be used under an NRC regulatory framework." A change to external regulation of facility safety and worker protection at DOE sites would require Congressional action including amendment of the Atomic Energy Act and OSHA.
40	Discussion of the fully burdened costs of disposal has been added. See Appendix N.
41	It is forecast that about 60,000 cubic meters of Hanford-generated operational MLLW will require disposal. The 14,000 cubic meters cited in the Hanford PMP do not represent the total volume of Hanford-generated MLLW. Half of the 14,000 cubic meters is MLLW already in storage. The other half is MLLW expected to be generated through 2008. The permit for MLLW disposal is not limited to Hanford Only waste. Discrimination against out-of-state waste would violate the Commerce Clause, Article 1, Section 8, of the United States Constitution.
42	This comment is not directed at DOE.
43	See Response 1.

3.6 Responses to Other Organizations and Individuals

Table 3.1. Organizational Comments and Responses

Source	Comment	Response
Citizens in Action Arnold, Nellie	PDA034/003	Foreign wastes (outside the U.S.) are not being imported to Hanford.
Citizens in Action Arnold, Nellie	PDA034/004	Foreign wastes (outside the U.S.) are not being imported to Hanford.
Columbia Riverkeeper deBruler, Gregory	L106/009	Specific discussion of the use of soil mounds over trenches as an interim measure to shed water has been included in this HSW EIS. Section 5.18.1 addresses potential groundwater mitigation measures, and DOE considers early capping as part of this discussion. The SAC analysis demonstrated that some advantages are associated with early capping.
Columbia Riverkeeper deBruler, Gregory	L106/010	LLW disposed prior to September 1987 may contain significant hazardous chemical inventories but no specific requirements existed to account for or to report of the content of hazardous chemical constituents in this category of LLW. As a consequence, analysis of these constituents and estimated impacts based on the limited amount of information on estimated inventories and waste disposal location would be subject to large uncertainty and would preclude a comprehensive analysis of these constituents at this time.
Columbia Riverkeeper deBruler, Gregory	L106/018	Decommissioning, surveillance, and maintenance activities that would occur after closure of the waste management facilities were not included within the scope of the first draft HSW EIS. Final resolution of the waste sites [which would include the surveillance, inspection, and maintenance activities] will become part of the overall Hanford environmental restoration closure program for the 200 Area.
Columbia Riverkeeper deBruler, Gregory	L106/019	Milestone M-15-00C of the TPA requires all 200 Area, non-tank farm, pre-record of decision site investigation activities to be completed by December 31 2008. Site characterization information generated from TPA remedial investigation and LLBG RCRA permitting activities has been used in development of the draft HSW EIS. It is not expected that the HSW EIS NEPA review process will need to be delayed pending completion of 200 Area site investigations under the TPA.

Table 3.1. (contd)

Source	Comment	Response
Columbia Riverkeeper deBruler, Gregory	L106/023	Additional information has been provided in the revised draft HSW EIS that will address this request. The updated analysis indicate similar general results to those outlined in the March 2002 Draft HSW-EIS. Although less waste is buried under the No Action Alternative relative to the amounts considered under all the Alternative Groups (A-E), the maximum impacts under the No Action Alternative are slightly larger due to two factors: - no barrier is considered thus source-term release is based on infiltration representative of surface conditions with natural vegetation that is generally higher than is estimated for barriercover conditions - the estimated inventories of key constituents that give rise to the maximum impacts on water quality and dose (Tc-99 in Cat 3 LLW and I-129 in MLLW) are is largely the same for all alternatives.
Columbia Riverkeeper deBruler, Gregory	L106/037	Use of soil debris model for contaminant is meant to be very conservative representation of actual constituent release in the source zone. In this model, the entire inventory is emplaced in the residual water content and is made immediately available for leaching. The rate of contaminant release out the bottom of the trench is controlled by the infiltration governed by surface soil conditions through the waste zone. This is far more conservative than conditions described by the commenter. The updated HSW EIS analysis does evaluate the potential impacts of these earlier disposals by evaluating the effect of higher infiltration rates during operations. Results of analyses of earlier disposal facilities using release and vadose zone infiltration rates of 5 cm/yr, a rate reflective of managed bare surface soil conditions over the older disposal areas during the operations phase, estimated arrival of mobile contaminants (such as technetium-99 and iodine-129) at immediate down-gradient locations several hundred years before impacts of later disposals were realized. Peak concentrations of technetium-99 and iodine-129 were estimated to arrive at down-gradient locations between years 2050 and 2100 from 200 East Area locations and year 2300 and 2350 from 200 West Area locations. These results are considered to be a bounding analysis of impacts in that: - It assumes the inventory in these early disposals would be immediately available for release and would be leached at

Table 3.1. (contd)

Source	Comment	Response
		rates reflective of this assumed high rate of infiltration. In reality, the actual leaching of wastes would be expected to be much lower. - The infiltration rate of 5 cm/yr assumed in the vadose zone transport is also likely to be much higher than would be expected. This high rate of infiltration applied in vicinity of waste trenches would be expected to decline to rates more reflective of natural recharge as it encounters soils in their natural dry state below the waste trenches and migrates downward and laterally in the vadose zone in the surrounding areas. Descriptions of the underlying assumptions and resulting estimated impacts (that is, contaminant concentration levels and peak arrival times) from these analyses are provided in detail in Appendix G. The updated analysis evaluates cap degradation. No guidance is available for specifying barrier performance after its design life. However, we do not expect an immediate decrease in performance is not expected, and it is likely that this specific barrier will perform as designed far beyond its design life. Without data to understand and predict long-term performance of the specific barrier, a conservative assumption is the performance of the barrier would degrade stepwise after reaching its design life, and until the recharge rate matches the natural recharge rate in the surrounding environment. This approach is based on the assumption that a degraded cover will eventually return back to its natural state and behave like the surrounding environment. The period of degradation was assumed to be the same as the design life. In the case of the modified RCRA, Subtitle C, cover, which has a design life of 500 years, the starting infiltration rate used in the release modeling begins at 0.01 cm/yr, after which the assumed rate increases stepwise in five equal steps over 500 years after the start of cover degradation (See Figure G.6). After 500 years of degradation, the infiltration rate used in the release modeling is assumed to be equivalent to the rate used to represent recharge for the natural surrounding environment (0.5 cm/yr). This rate was used during the remaining 9,000 years of this assessment.

Table 3.1. (contd)

Source	Comment	Response
Columbia Riverkeeper deBruler, Gregory	L106/038	The contaminant transport model is discussed in Chapter 5 and the Appendices. The assessments documented here are based on the assumptions used in these models. "Problems" with model assumptions are discussed throughout the EIS. These results meet all the requirements in the National Environmental Policy Act (NEPA) of 1969, as amended (42 USC 4321 et seq.), the DOE implementing procedures for NEPA (10 CFR 1021), and the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500-1508). This comment does not change the assessment documented in the HSW EIS.
Columbia Riverkeeper deBruler, Gregory	L106/039	Characterization information. These analysis would require a more thorough and detailed characterization of these wastes at some future date. This issue is currently under review and transport of hazardous chemical constituents may be included in the final HSW EIS if additional information on hazardous chemical inventories and their transport and impacts are found to be significant. Besides inventory, the key associated include estimates of infiltration, hydraulic properties, and constituent mobility properties, which in the case of this assessment is the distribution coefficient (kd). The current version of the site-wide model relies on a three-dimensional representation of the aquifer system that was calibrated to Hanford Sitewide groundwater monitoring data collected during Hanford operations from 1943 to the present. The calibration procedure and results for this model are described in Cole et al. (2001a). This recent work is part of a broader effort to develop and implement a stochastic uncertainty estimation methodology in future assessments and analyses using the sitewide groundwater model (Cole et al. 2001b). Resulting distribution of hydraulic conductivities from this recent calibration effort is provided in Figures G.11 and 12 in App G of Updated HSW-EIS. The assessment was the beneficiary of preceding analyses and field observations including the performance assessments for 200 West and 200 East post-1988 burial grounds (Wood et al. 1995, 1996), the remedial investigation and feasibility study of the ERDF (DOE 1994b), the disposal of ILAW originating from the single- and double-shell tanks (Mann et al. 1997) and (DOE/ORP 2001), and the Composite Analysis of the 200 Area Plateau (Kincaid et al. 1998). These and other analyses, (for example, environmental impact statements) included development of inventory data and application of screening or significance criteria to identify those radionuclides that could be expected to significantly contribute to either the dose or

Table 3.1. (contd)

Source	Comment	Response
		risk calculated in the respective analysis. Clearly, those radionuclides identified as potentially significant in these published analyses are also expected to be key radionuclides in this assessment. To establish the relative mobility of each contaminant, they were grouped based on their mobility in the vadose zone and underlying unconfined aquifer that were based the best available information on distribution coefficients collected at Hanford. Contaminant groupings were used, rather than the individual mobility of each contaminant, primarily because of the uncertainty involved in determining the mobility of individual constituents. The groups were selected based on relatively narrow ranges of mobility, and constituents were placed in the more mobile group uncertainty was present concerning which group they should be placed in. Except for those with estimated Kds of zero, the actual Kd used were more conservative that those estimated from Hanford specific information and data. Information of this Hanford Site data are provided in Appendix G. Some of the constituents, such as iodine and technetium, would move at the rate of water whether in the vadose zone or underlying groundwater. The movement of other constituents in water, such as americium and cesium, would be slowed or retarded by the process of sorption onto soil and rock. A parameter that is commonly used to represent a measure of this sorption is referred to as the distribution coefficient or Kd. This parameter is defined as the ratio of the quantity of the solute adsorbed per gram of solid to the amount of solute remaining in solution (Kaplan et al. 1996). Values of Kd for the constituents range from 0 mL/g (in which the (in which the contaminant movement in water is not retarded) to more than 40 mL/g (in which the contaminant moves much slower than water).
Columbia Riverkeeper deBruler, Gregory	L106/051	DOE's consideration of the Endangered Species Act Section 7 consultation process is in Section 5.5.4 and Appendix I of the DEIS. Appendix I includes a copy of the April 23, 2002 response to the DOE consultation letter from the Fish and Wildlife Service and documentation of the telephone response from the National Marine Fisheries Service.
Columbia Riverkeeper deBruler, Greg	RL005/005	Comment noted.

Table 3.1. (contd)

Source	Comment	Response
Government Accountability Project, Nuclear Weapons Oversight Gilbert, Clare	L104/006	Decisions regarding ER (cleanup) waste are made through the CERCLA process. At Hanford LLW and MLLW retrieved as a result of cleanup activities would go to ERDF. TRU waste retrieved as a result of cleanup activities would be processed and sent to WIPP.
Government Accountability Project, Nuclear Weapons Oversight Gilbert, Clare	L104/007	The WM PEIS was a comprehensive evaluation of DOE nationwide waste management, and DOE determined there was sufficient information to make decisions regarding the sites that were suitable for long-term waste management missions. The HSW EIS evaluates alternatives consistent with WM PEIS decisions at Hanford. A discussion of the WM PEIS and its relationship to the HSW EIS can be found in Section 1.5. Not withstanding the above, as encouraged by Ecology and others, the HSW EIS includes an evaluation that assumes only Hanford wastes are managed at Hanford in the future.
Government Accountability Project, Nuclear Weapons Oversight Gilbert, Clare	L104/031	The assumptions stated in the comment are not correct. The ERPGs, published by the American Industrial Hygiene Association, are widely accepted for emergency planning purposes. The definitions of the various ERPGs state they are “The maximum concentration in air below which it is believed nearly all individuals could be exposed for up to one hour without experiencing...” …the given effect. These guides are applicable to nearly all individuals, possibly excluding only that very small percentage of hypersensitive individuals. 1. The Emergency Response Planning Guideline (ERPG) values are intended to provide estimates of concentration ranges where one reasonably might anticipate observing adverse effects as described in the definitions for ERPG-1, ERPG-2, and ERPG-3 as a consequence of exposure to the specific substance. The ERPG-1 is the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hr without experiencing other than mild transient adverse health effects or perceiving a clearly defined, objectionable odor. The ERPG-2 is the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hr without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action.

Table 3.1. (contd)

Source	Comment	Response
		The ERPG-3 is the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hr without experiencing or developing life-threatening health effects. It is recognized by the committee that human responses do not occur at precise exposure levels but can extend over a wide range of concentrations. The values derived for ERPGs should not be expected to protect everyone but should be applicable to most individuals in the general population. In all populations there are hypersensitive individuals who will show adverse responses at exposure concentrations far below levels where most individuals normally would respond. Furthermore, since these values have been derived as planning and emergency response guidelines, not exposure guidelines, they do not contain the safety factors normally incorporated into exposure guidelines. Instead, they are estimates, by the committee, of the thresholds above which there would be unacceptable likelihood of observing the defined effects. The estimates are based on the available data that are summarized in the documentation. In some cases where the data are limited, the uncertainty of these estimates is large. Users of the ERPG values are encouraged strongly to review carefully the documentation before applying these values. In developing these ERPGs, human experience has been emphasized to the extent data are available. Since this type of information, however, is rarely available, and when available is only for low level exposures, animal exposure data most frequently forms the basis for these values. The most pertinent information is derived from acute inhalation toxicity studies that have included clinical observations and histopathology. The focus is on the highest levels not showing the effects described by the definitions of the ERPG levels. Next, data from repeat inhalation exposure studies with clinical observations and histopathology are considered. Following these in importance are the basic, typically acute studies where mortality is the major focus. When inhalation toxicity data are either unavailable or limited, data from studies involving other routes of exposure will be considered. More value is given to the more rigorously conducted studies, and data from short-term studies are considered to be more useful in estimating possible effects from a single 1-hr exposure. Finally, if mechanistic or dose-response data are available, these are applied, on a case by case basis, as appears appropriate. It is recognized that there is a range of times that one might

Table 3.1. (contd)

Source	Comment	Response
		consider for these guidelines; however, it was the committee's decision to focus its efforts on only one time period. This decision was based on the availability to toxicology information and a reasonable estimate for an exposure scenario. Users who may choose to extrapolate these values to other time periods are cautioned to review the documentation fully since such extrapolations tend to hold only over very limited time frames, it at all.
Government Accountability Project, Nuclear Weapons Oversight Gilbert, Clare	L104/032	The assumptions stated in the comment are not correct. The use of radiation dose rates (and quality factors) is widely accepted as a basis for estimating the potential risk of latent cancer fatalities from radiation exposure. In fact, first calculating the radiation dose is the only scientific way to make such risk estimates and is particularly appropriate to populations. Radiation dose is the energy absorbed by a material, such as tissue. The linear energy transfer (LET) of a given type and energy of radiation (LET is not radionuclide-specific) is accounted for in the radiation quality factor, which modifies (by increasing) the radiation dose, the product of these two being the radiation dose equivalent. Radiation dose equivalent is often calculated for individuals because regulatory limits are in terms of individual dose, and this dose is sometimes converted to an estimate of the individual's risk (probability) of a latent cancer fatality. However, the estimates of cancer risk from radiation exposure are most appropriately applied to populations, because it is from exposed populations that the basic dose-to-risk conversion factors are estimated.
Government Accountability Project, Nuclear Weapons Oversight Gilbert, Clare	L104/033	The MEPAS code was used to evaluate the impacts from exposure to chemicals. This code uses the standard EPA guidance and toxicity factors as suggested.
Government Accountability Project, Nuclear Weapons Oversight Gilbert, Clare	L104/034	The MEPAS code was used to evaluate the impacts from exposure to chemicals. This code uses the standard EPA guidance and toxicity factors as suggested.
Government Accountability Project, Nuclear Weapons Oversight Gilbert, Clare	L104/035	The draft HSW EIS uses best available data for estimating inventories of hazardous and radioactive wastes. These data are obtained from information management systems maintained at Hanford and other DOE sites. Most of the waste will be generated by environmental restoration activities, and there is uncertainty about the amounts that will be generated. To address this uncertainty, the draft HSW EIS uses high- and low-bounded waste volume and radionuclide estimates to evaluate impacts.
Government Accountability Project, Nuclear Weapons Oversight Gilbert, Clare	L104/040	The scope of the HSW EIS is to evaluate the potential environmental impacts of ongoing activities of the Hanford Solid Waste Program, to evaluate implementation of alternatives consistent with the WM PEIS, and to evaluate reasonably

Table 3.1. (contd)

Source	Comment	Response
		foreseeable treatment, storage, and disposal facilities and activities. DOE is working with the State of Washington Department of Ecology and the Region X US EPA to establish more specific terms and conditions for implementation of the waste management actions proposed in the HSW EIS.
Government Accountability Project, Nuclear Weapons Oversight Gilbert, Clare	L104/041	The HSW EIS summarizes activities and projected completion dates under the TPA M-91 Milestone in Table 6.1. The HSW EIS also addresses the impacts of processing and certification of TRU waste for disposal at the Waste Isolation Pilot Plant. Management of suspect TRU waste and other past-buried wastes will be addressed under the Hanford CERCLA program.
Government Accountability Project, Nuclear Weapons Oversight Gilbert, Clare	L104/045	The DOE endeavors to make its EIS documents easily readable to a wide audience with diverse interests, training, and professional backgrounds. The HSW EIS also must use descriptive nomenclature long associated with the Hanford site and nomenclature used for DOE implementation of NEPA and other regulatory programs. Some of the technical and regulatory nomenclature is complicated and may lose its meaning when used in the context of public review, and it may need to be paraphrased or somehow simplified so that is does not unnecessarily burden or distract many EIS readers. The EIS is intended to scientifically and consistently estimate environmental impacts of proposed actions so that they can be compared, and so an informed decision can be made in selecting an alternative. The analyses in an EIS are not intended to be used in making scientific predictions.
Government Accountability Project, Nuclear Weapons Oversight Gilbert, Clare	L104/046	Please see the response to comment L104-44.
Government Accountability Project, Nuclear Weapons Oversight Gilbert, Clare	L104/047	The curie is an appropriate unit for communicating the radiological inventory remaining at Hanford and the environmental impacts of radiological contamination. It also facilitates comparison with certain regulatory standards, such as EPA Maximum Contaminant Level standards (MCLs) established under the Safe Drinking Water Act. The comment correctly recognizes that there is far more complexity in ways that radioactivity can be measured. The science of radiological health physics is a crucial component of the HSW EIS, and more highly detailed radiological metrics have been used in its health impact analysis (Appendix F).
Hanford Information Network Unidentified	L084/004	DOE plans to vitrify the contents of the underground waste storage tanks at Hanford. The vitrification process will be conducted in accordance with Federal and Washington State regulatory requirements. Alternatives for disposition of tank waste were examined in the "Tank Waste Remediation System

Table 3.1. (contd)

Source	Comment	Response
		Environmental Impact Statement" which is discussed in Section 1.5.3 of the DEIS.
Hanford Information Network Unidentified	L084/011	Several alternative treatment facilities are considered for each primary waste streams in the revised draft HSW EIS. These include the use of existing onsite facilities or offsite contracts, construction of new treatment facilities, modification of existing onsite facilities, and/or the use of modular units. The final selection of treatment technologies will likely be addressed in future NEPA actions. The costs of the various alternatives will be presented in Section 3 of the revised draft HSW EIS.
Hauck Consultants Hauck, Jim	L002/002	This is not the experience at Hanford. Use of HIC, In-place trench grouting, and macro-encapsulation of wastes is routinely used for stabilization of Category 3 LLW and other wastes containing elevated inventories of technetium-99, iodine-129, and uranium isotopes.
Heart of America Northwest Lee, Hyun	E013/000	Document L097 is the letter version of the e-mail attachment of comments. See document L097 for the responses.
Heart of America Northwest Lee, Hyun S.	L097/008	Operational details of managing the trenches, such as leaving them uncapped while they are being filled, were not used as a basis for evaluating the alternatives in the draft HSW EIS. LLW sent to the trenches must meet stringent waste acceptance criteria that prevents the release of radionuclide contaminants. MLLW sent to hazardous waste management trenches must meet waste acceptance criteria and RCRA land disposal restriction treatment standards. The MLLW trenches must also meet RCRA technology standards that include requirements for liners and leachate collection.
Heart of America Northwest Lee, Hyun S.	L097/012	Any offsite DOE waste sent to Hanford must satisfy the Hanford Waste Acceptance Criteria. A percentage of waste shipments and containers are selected for receipt verification. These containers can be inspected visually, verified by nondestructive examination, or sampled for field or laboratory analysis to confirm that the waste matches the Waste Profile Sheet. Any discrepancies between the verification results and the Waste Profile Sheet must be resolved before final acceptance on the Hanford Site. Further information on the Waste Acceptance Criteria is available at: http://www.hanford.gov/wastemgt/wac/acceptcriteria.cfm.
Heart of America Northwest Lee, Hyun S.	L097/034	Investigations of Hanford waste management units will be performed within the framework of the TPA, and under CERCLA, RCRA, or WHWMA authorities, as appropriate.
Heart of America Northwest Lee, Hyun S.	L097/042	DOE regulates disposal of DOE radioactive waste under authority granted by the Atomic Energy Act. DOE LLBGs are operated in accordance with DOE Order 435.1 and DOE Manual 435.1-1. Mixed waste trenches on the Hanford Site

Table 3.1. (contd)

Source	Comment	Response
		are operated in accordance with DOE Order 435.1, DOE Manual 435.1-1, and Department of Ecology regulations. DOE's basis for regulation of DOE LLBGs as compared to commercial LLBGs is set out beginning at p. A-152 of Appendix A of the "Implementation Guide for use with DOE M 435.1-1." Appendix A can be accessed at URL: <http://www.directives.doe.gov/>. Appendix A states that: "The regulation of low-level waste at DOE facilities, as developed in DOE Order 435.1, differs from the more generic but prescriptive approach taken by the Nuclear Regulatory Commission (NRC) in developing requirements for commercial facilities in 10 CFR Part 61 and other rules. 10 CFR Part 61 was developed with several known conditions that are specific to commercial waste and are not necessarily appropriate for DOE low-level waste. These differences include (1) NRC has a formal licensing process while DOE uses the Directives process; (2) NRC requirements are for generic but unknown facilities and locations; (3) commercial waste streams are well defined; (4) DOE processed spent fuel for spent nuclear material; (5) DOE disposes of low-level waste onsite, where practical, at facilities which have been operating for many years; (6) land use controls for DOE low-level waste disposal facilities are likely to extend into the distant future; and (7) the management structure for DOE complex-wide low-level waste management is well established. These factors lead to differences in waste management regulation and practices for DOE and NRC low-level waste disposal; however, the required level of health protection is essentially identical."
Heart of America Northwest Lee, Hyun S.	L097/045	Discussion of impacts of the alternatives and cumulative impacts has been revised. The hypothetical wells discussed in the HSW EIS are modeled points of maximum concentration over time along lines approximately 1 kilometer down gradient from the overall waste facilities in the 200 East Area, the 200 West Area, the ERDF, and along a line near the river. The wells are not intended to represent existing or planned locations of monitoring wells. Section 5.3 and Appendix G have been revised.
Heart of America Northwest Lee, Hyun S.	L097/062	The US Ecology facility is not operated by the DOE, and regulatory issues at the US Ecology facility cannot be addressed by DOE in the draft HSW EIS. A description of the US Ecology operation has been added in Section 1.3 of the revised draft HSW EIS.

Table 3.1. (contd)

Source	Comment	Response
Heart of America Northwest Lee, Hyun S.	L097/063	The US Ecology facility is not operated by DOE; however, its environmental impacts have been evaluated in the HSW EIS.
Heart of America Northwest Pollet, Gerald	RL003/004	The U.S. Department of Energy (DOE) is committed to cleanup of the Hanford Site through the Tri-Party Agreement (TPA) process. A lot in the way of cleanup has happened at Hanford over the last decade. Portions of the site have already been cleaned up, removed from the National Priority List (NPL), and released for other uses (e.g., the 1100 Operable Unit). As part of the river corridor cleanup, DOE is remediating contaminated soil sites, decommissioning the plutonium production reactors and associated facilities, removing production reactor fuel from the K Basins to interim storage in the 200 Area, and treating groundwater contaminated by past operations. DOE is responsible for the cleanup of dozens of sites around the country. DOE's approach is to consolidate and dispose of radioactive waste from all its cleanup efforts in the safest and most cost-effective manner possible. Hanford and other sites would be available for the disposal of low-level waste and mixed low-level waste; WIPP is used for the disposal of TRU waste; Yucca Mountain is expected to be used for the disposal of high-level waste and spent nuclear fuel. Many more curies of waste will be sent offsite from Hanford than will be received from offsite. Analysis indicates that these wastes could be handled without complicating future remediations, or diverting resources or disposal capacity from other Hanford cleanup activities. DOE has added alternatives that include disposal of LLW in lined trenches with leachate collection systems (see Section 3.1).Groundwater impacts from Low-Level Waste Management Areas (WMAs) 1, 2, 3, and 4 are discussed in Sections 2.8 and 2.9 in Hanford Site Groundwater Monitoring for Fiscal Year 2001 (Hartman et al. 2002), which addresses the eight LLBGs in question. Based on results of fence line monitoring of the WMAs, the current interpretation is that there is no evidence that the specific WMAs in question have contributed to contaminants found in groundwater underlying these areas. See Section 5.3.3.1 of this HSW EIS.
Heart of America Northwest Pollet, Gerald	RL003/005	With some exceptions, estimated inventories of hazardous chemical constituents associated with LLW and MLLW disposed after 1988 being considered under each alternative were be expected to be found at trace levels. In particular, MLLW, which would be expected to contain the majority of hazardous chemical constituents, would undergo pre-disposal treatment to meet current Waste Acceptance Criteria and Land Disposal Restrictions before being disposed of in permitted MLLW facilities. Consequently, groundwater quality impacts

Table 3.1. (contd)

Source	Comment	Response
		from these constituents would not be considered significant. Analysis of MLLW inventories for this assessment did identify two exceptions that included lead and mercury inventories associated with the projected MLLW that were estimated at 336 kg (741 lb) and 2.5 kg (5.5 lb), respectively. Because of its affinity to be sorbed into Hanford Sediments, lead falls within the Kd Group 5 (Kd = 40 mL/g) and would not release to groundwater within the 10,000-year period of interest in this analysis. The inventory estimated for mercury is assumed to be small enough that it would not release to groundwater in substantial concentrations. Even the most conservative estimates of release would yield estimated groundwater concentrations at levels of two orders of magnitude below the current standard of 0.002 mg/L.
Heart of America Northwest Pollet, Gerald	RL003/017	TRU storage facilities are described in Section 2.2 of the DEIS. Ultimate disposition of DOE TRU waste will be at the WIPP facility in New Mexico.
Heart of America Northwest Pollet, Gerald	SEA010/017	Some of the LLBG trenches stopped receiving solid wastes many years ago, and they were filled and covered in accordance with management practices applicable at the time of their closure. Appendix D of the first draft HSW EIS provide graphics showing the operating status of LLBG trenches. Subsidence of the soil covering some of the older buried waste disposal trenches have been observed by DOE.
Heart of America Northwest Pollet, Gerald	SEA010/021	The shut-down date (date when active waste management operations will end) used in the first DEIS was the year 2046. This year was chosen to complement the impact analysis time periods in the WM PEIS. The actual shut-down year will depend on many factors related to completion of the DOE cleanup mission. The 2002 HPMP currently envisions a shut-down year of 2035. Characterization of releases from LLBG disposal units, if any, will be addressed under the framework of the TPA, CERCLA, and RCRA permitting authorities, if and when appropriate.
Heart of America Northwest Wheatley, Helen	SEA013/004	The case of United States of America v. Kentucky, 252 F.3d 816, (6th Circuit 2001) is a recent holding affirming that DOE has exclusive authority to regulate the radioactive component of DOE mixed waste and that EPA, or states authorized by EPA under RCRA, retain the authority to regulate the hazardous portion of the mixed waste.
Heart of America Northwest Wheatley, Helen	SEA013/010	The summary is meant to present an overview of what is in the actual EIS itself, which may consist of several volumes. As such, it is not meant to go into any depth on the details of the EIS, but to serve as a guide to the more detailed material.
Heart of America Northwest Wheatley, Helen	SEA013/022	The DEIS has been prepared with the best available information.

Table 3.1. (contd)

Source	Comment	Response
Northwest Environmental Defense Center Hippert, Dona	L091/009	Doses for intrusion scenarios at 10,000 years after disposal-site closure have been calculated and are included in the EIS.
Northwest Environmental Defense Center Hippert, Dona	L091/010	DOE's basis for regulation of DOE LLW is set out beginning at p. A-152 of Appendix A of the "Implementation Guide for use with DOE M 435.1-1." Appendix A can be accessed at URL: http://www.directives.doe.gov/. Appendix A states that: "These factors lead to differences in waste management regulation and practices for DOE and NRC low-level waste disposal; however, the required level of health protection is essentially identical."
Northwest Environmental Defense Center Hippert, Dona	L091/016	The Hanford Site Solid Waste Acceptance Criteria document and the draft LLBG Dangerous Waste Permit provide more detailed information about waste inspection and verification. These are incorporated into the draft HSW EIS by reference.
Northwest Environmental Defense Center Hippert, Dona	L091/017	The analysis does include closure evaluations. The closure cover analyzed (modified Resource Conservation and Recovery Act [RCRA] Subtitle C cover) is shown in Figure 2.15. The development of borrow pits for closure material is described in Appendix D. As identified in Section 3.7 the costs for alternative groups do include the costs for capping. Details of the costs can be found in Appendix C of the Technical Information Document (FH 2002). The environmental analysis of these actions is contained in Section 5.0.
Northwest Environmental Defense Center Hippert, Dona	L091/018	The draft HSW EIS includes discussion of uncertainty. Uncertainty is addressed by evaluating impacts resulting from management of Hanford only lower bound and upper bound waste quantities.
Northwest Environmental Defense Center Hippert, Dona	L091/019	The TPA is a living document that has been amended numerous times. Information on cleanup progress at Hanford can be accessed at: http://www.hanford.gov/doe/progress/progress.htm. This web site includes information on meeting TPA milestones. Further information on the TPA is available at URL: http://www.hanford.gov/tpa/tpahome.htm.
Northwest Environmental Defense Center Hippert, Dona	L091/020	The 200 Area non-tank farm investigations are scheduled to be completed by December 31, 2008 pursuant to Milestone M-15-00C of the TPA. Information from Hanford site characterization activities has been used in the HSW EIS.

Table 3.1. (contd)

Source	Comment	Response
Northwest Environmental Defense Center Hippert, Dona	L091/023	The relationship between the HSW EIS and the River Protection Project (tank waste remediation program) is presented in Sections 1.0. Additional NEPA documentation for Hanford wastes may be found at: http://www.hanford.gov/netlib/eis.asp.
Northwest Environmental Defense Center Hippert, Dona	L091/024	The projected waste quantities in the draft HSW EIS are based on average amounts of waste generated over a recent three-year period that included 1996, when 102.4 metric tons of surplus uranium were disposed in the LLBG. The resulting averages include a projected 34 metric tons per year of surplus uranium disposal in LLBG trenches.
Northwest Environmental Defense Center Hippert, Dona	L091/025	The final closure cap design has not yet been decided, the draft HSW EIS assumes use of a modified RCRA Subtitle C cap. Infiltration is to be shed by a layer of low-permeability asphalt and overlying lateral drainage layers of sand and gravel.
Northwest Environmental Defense Center Hippert, Dona	L091/027	Mobile treatment facilities are not precluded by the evaluations in the draft HSW EIS. Information about use of mobile treatment facilities has been added in the revised draft HSW EIS.
Northwest Environmental Defense Center Hippert, Dona	L091/028	The costs as shown in Table 3.6 are constant value life-cycle costs. No discounting of costs was used for future activities. The methodology used for all alternatives was consistent. Details of the cost estimates can be found in Appendix C of FH2002. Additional information has been added to Section 3.5 and Table 3.6 in the second DEIS.
Northwest Environmental Defense Center Hippert, Dona	L091/029	Information about management of spent reactor fuel and high-level waste has been added in Sections 1.3.4.3 and 1.3.4.4 of the revised draft HSW EIS.
Northwest Environmental Defense Center Hippert, Dona	L091/030	Underground pipelines are used to transfer process effluents in accordance with the TPA, dangerous waste management requirements, and state waste discharge permits. Hanford waste management activities comply with the RCRA 90-day hazardous waste storage limitation where its applicable.
Northwest Environmental Defense Center Hippert, Dona	L091/031	DOE routinely monitors external radiation levels and radionuclides in soil within the LLBGs. The data referred to in the HSW EIS were obtained from the near field monitoring program, and would have detected transuranic or other radionuclides long before they entered the vadose zone or groundwater.
Northwest Environmental Defense Center Hippert, Dona	L091/032	Background radiation was explained in Section 4.3.4 of the first draft HSW EIS. The total collective dose from naturally occurring radiation sources (300 mrem per year per individual) was used in Section 5.14 to assess radiological impacts from Hanford low-level waste management activities.

Table 3.1. (contd)

Source	Comment	Response
Northwest Environmental Defense Center Hippert, Dona	L091/033	Section 4.5.1.4 contains details on surface water quality. Additional information is in the Hanford Site Environmental Report 2001(Poston et al 2002) and the Hanford Site National Environmental Policy Act (NEPA) Characterization document (Neitzel 2002). This comment does not change the assessment documented in the HSW EIS, therefore, no changes were made in the HSW EIS.
Northwest Environmental Defense Center Hippert, Dona	L091/034	Native perennial shrubs and bunchgrasses generally dominate plant communities on the site. However, Euro-American settlement and development have resulted in the proliferation of nonnative species. Of the 590 species of vascular plants recorded on the Hanford Site, approximately 20 percent of the species are considered nonnative (Sackschewsky et al. 1992). Additional information can be found in Section 4.6 of the revised draft HSW EIS.
Northwest Environmental Defense Center Hippert, Dona	L091/036	There are no reports of amphibians or water-reliant wildlife at West Lake (Neitzel 2002). Applicable environmental impacts are discussed in Section 5.5 and Appendix I of the HSW EIS.
Northwest Environmental Defense Center Hippert, Dona	L091/039	Environmentally conservative modeling methods have been used in the draft HSW EIS to evaluate impacts. Appendix E presents the details of the air quality impact analysis.
Northwest Environmental Defense Center Hippert, Dona	L091/044	Long-term impacts on water quality were addressed in Section 5.3.3 of the first draft HSW EIS. Section 5.3.3 of the revised draft HSW EIS has been expanded to address long-term water quality impacts of the new and reconfigured alternatives.
Rachel's Friends/ Breast Cancer Coalition Grumpacker, Nancy	PDA013/004	Potential health impacts are considered for the next 10,000 years in this HSW EIS.
The Mountaineers Eades, Glenn	L092/010	Information on DOE's beryllium disease prevention program is available at: http://tis.eh.doe.gov/be/. Information on DOE's program to apply sanctions to DOE contractors for unsafe actions or conditions that violate nuclear safety requirements for protecting workers and the public is available at: http://tis.eh.doe.gov/enforce/index.html-ssi.
The Mountaineers Herbst, Rodger	SEA039/007	Sending LLW and MLW to Hanford is consistent with WM PEIS decisions and technical factors such as irreparable past contamination and low precipitation. Hanford is an appropriate location for disposal of LLW and MLW. Ecology's Model Toxic Control Act is concerned with cleaning up hazardous waste sites in the state.
Washington Physicians for Social Responsibility Takaro, Trombold, Fleck & Yarrow, Tim, Jim, Martin & Ruth	L102/018	The DEIS does not specifically evaluate cap designs and their performance. Cap performance was more simply represented by a ten-fold decrease in infiltration through waste disposal units with caps.

Table 3.2. Individual Comments and Responses

Source	Comment	Response
Albertson, Steve	ML002-14/002	The U.S. Department of Energy (DOE) is committed to cleanup of the Hanford Site through the Tri-Party Agreement (TPA) process. A lot in the way of cleanup has happened at Hanford over the last decade. Portions of the site have already been cleaned up, removed from the National Priority List (NPL), and released for other uses (e.g., the 1100 Operable Unit). As part of the river corridor cleanup, DOE is remediating contaminated soil sites, decommissioning the plutonium production reactors and associated facilities, removing production reactor fuel from the K Basins to interim storage in the 200 Area, and treating groundwater contaminated by past operations. DOE is responsible for the cleanup of dozens of sites around the country. DOE's approach is to consolidate and dispose of radioactive waste from all its cleanup efforts in the safest and most cost-effective manner possible. Hanford and other sites would be available for the disposal of low-level waste and mixed low-level waste; WIPP is used for the disposal of TRU waste; Yucca Mountain is expected to be used for the disposal of high-level waste and spent nuclear fuel. Many more curies of waste will be sent offsite from Hanford than will be received from offsite. Analysis indicates that these wastes could be handled without complicating future remediations, or diverting resources or disposal capacity from other Hanford cleanup activities. DOE has added alternatives that include disposal of LLW in lined trenches with leachate collection systems (see Section 3.1). In 2001 alone, samples were collected from 735 groundwater monitoring wells to determine the distribution and movement of existing radiological and chemical constituents in Hanford Site groundwater and identify and characterize potential and emerging groundwater contamination problems. Samples were analyzed for about 40 different radionuclide constituents and about 290 different chemical constituents.
Ayotte, Dave	F074/001	Please see the responses to comments F074-2 through F074-4.
Bee, Robin	F025/003	The HSW EIS analyses do not take any credit for liners in estimating the impacts of solid waste on groundwater even when they are part of the alternatives. It appears that caps can provide protection for a longer period.

Table 3.2. (contd)

Source	Comment	Response
Beyer, Edward	PDA020/003	This is a repeat of the previous and not a comment.
Boese, Bill	PDA010/006	National Environmental Policy Act (NEPA) studies are required by law.
Buich, Nancy	P002/002	What has been observed in the vadose zone beneath tank farms were the results of leaks of large volumes of tanks wastes containing extreme geochemical conditions of pH and salt content. The enhanced migration of complexed cobalt-60 originated from a discharge sites in the B-BX-BY WMA that received large amounts of liquid wastes. LLBGs have not received tank wastes nor have they received large volumes of liquid wastes and there is no evidence that similar geochemical conditions persists beneath LLBGs.
Call, Beth	MP003-029/003	In addition to the Hanford Waste Treatment Plant program, DOE must proceed with other environmental and waste management activities that are reliant on Hanford waste treatment and disposal facilities.
Carnahan, Bob	HR009/002	The draft HSW EIS provides general descriptions of radioactive waste treatment and processing facilities in Section 2.0. While it must be recognized that most treatment technologies may have limitations, treated wastes must meet applicable regulatory standards and waste acceptance criteria prior to disposal at Hanford.
Cimon, Norm	F015/003	The socioeconomic impacts of each alternative (focusing on Hanford cleanup) are analyzed in Section 5.6. Even under the No Action Alternative of the first draft HSW EIS, cleanup activities at Hanford continue and contaminated sites and groundwater are and well continue being cleaned up. These areas will be cleaned up to "industrial use classifications" and radioactive/hazardous areas will be protected from intrusion.
Cimon, Shelley	L011/004	NEPA review documentation provides a foundation for, and a supplement to, environmental documentation developed specifically for other regulatory programs. The draft HSW EIS, as a NEPA review document, is not intended to function as, or contain the same information as, a compliance agreement, a permit, or a management plan under other Hanford regulatory programs. The scope of the draft HSW EIS does not include evaluation of potential impacts resulting from pre-1970 LLBG transuranic wastes. These will be addressed through CERCLA response activities and other NEPA documentation, as appropriate.
Civiletti, Jane	F029/008	Comment noted.
Civiletti, Jane	F029/009	Treatment may be required if a TRU waste exhibits hazardous waste characteristics. Generally, RCRA hazardous waste regulations require that wastes meet RCRA treatment standards prior to land disposal. Treatment to eliminate the radioactive characteristics of TRU is not possible with current technologies.

Table 3.2. (contd)

Source	Comment	Response
Davis, Robert	PDA021/001	Risk analysis is used throughout the draft HSW EIS. See particularly Appendices F, G, H and I in Volume II, first draft HSW EIS, and the sections the appendices support in Volume I.
Devoy, Tiffany	F077/001	Comment noted.
Devoy, Tiffany	F077/004	We apologize for the confusion of signing in to give public comments. In trying to support and accommodate a wide variety of public interest groups who also wanted to have tables set up to provide information, things got crowded and at times confusing. We do not always have control over how other groups present their sign in logs, unfortunately this resulted in numerous lists for people at a wide variety of tables. Written comments are the best way to voice an opinion and to receive a response. In the spirit of NEPA and public information, public meetings begin with a short presentation by a DOE official on the EIS process, the overall waste management program at the Hanford Site, and an overview of DOE proposed actions and the draft HSW EIS scope. State and Federal regulatory agencies and local public interest groups also made introductory presentations. A question-and-answer session was held prior to the official comment period. Commenters, representing themselves or various organizations, were heard on a first-come, first-served basis based on a sign-up sheet at the registration table. All were encouraged to provide written versions of their oral comments for the record. Oral comments were recorded by a court reporter and are part of the official draft HSW EIS public meeting record. Printed information was available, and opportunities were provided before each meeting for informal discussion about the DOE proposed action and the scope and content of the draft HSW EIS. Forms for those who wished to submit written comments instead of or in addition to oral statements, also were provided. Not all commenters were able to speak because of time limitations at the facility in Portland and so another forum was held. Everyone who signed up to speak was given an opportunity.
Engstrom, Karin	E014/002	The shipment was TRU waste being shipped to the Waste Isolation Pilot Plant (WIPP) in southern New Mexico for permanent disposal. Pursuant to the WM PEIS, the WIPP SEIS, and related DOE records of decision, TRU wastes may be stored or processed at Hanford prior to final disposal at WIPP.

Table 3.2. (contd)

Source	Comment	Response
Follingstad, Joyce	PDB012/002	Risk assessment is an applied process employable in considering and evaluating alternatives. By necessity it uses models, formulas and quantitative data. Public questioning and input to risk assessment studies are an invaluable means to ensuring that the risk assessment process considers all of the viable alternatives.
Follingstad, Joyce	PDB012/010	The truckloads the commenter is referring to have not yet started. However, the Hanford Site has received thousands of shipments of radioactive waste from offsite generators over the years.
Garner, Marilyn	L068/004	Section 6 contains an extensive discussion of applicable regulatory requirements and permits. A discussion of the impacts of transporting waste to and from Hanford through the states of Oregon and Washington has been added to this HSW EIS (see Sections 2.2.4, 5.8, and Appendix H). A discussion of the storage of offsite TRU waste at Hanford pending its disposal at WIPP is also included in this HSW EIS (see Section 5 and its associated appendixes).
Grim, Paul	F006/004	The U.S. Department of Energy (DOE) is committed to cleanup of the Hanford Site through the Tri-Party Agreement (TPA) process. A lot in the way of cleanup has happened at Hanford over the last decade. Portions of the site have already been cleaned up, removed from the National Priority List (NPL), and released for other uses (e.g., the 1100 Operable Unit). As part of the river corridor cleanup, DOE is remediating contaminated soil sites, decommissioning the plutonium production reactors and associated facilities, removing production reactor fuel from the K Basins to interim storage in the 200 Area, and treating groundwater contaminated by past operations. DOE is responsible for the cleanup of dozens of sites around the country. DOE's approach is to consolidate and dispose of radioactive waste from all its cleanup efforts in the safest and most cost-effective manner possible. Hanford and other sites would be available for the disposal of low-level waste and mixed low-level waste; WIPP is used for the disposal of TRU waste; Yucca Mountain is expected to be used for the disposal of high-level waste and spent nuclear fuel. Many more curies of waste will be sent offsite from Hanford than will be received from offsite. Analysis indicates that these wastes could be handled without complicating future remediations, or diverting resources or disposal capacity from other Hanford cleanup activities. DOE has added alternatives that include disposal of LLW in lined trenches with leachate collection systems (see Section 3.1). The HSW EIS analyses do not take any credit for liners in estimating the impacts of solid waste on groundwater even when they are part of the alternatives. It appears that caps can provide protection for a longer period.

Table 3.2. (contd)

Source	Comment	Response
Hedlund, Bob	PDB016/004	Comment noted.
Hertz, Karen	ME001-08/002	The Hanford clean-up effort is expected to be completed in 2035.
Hines, Maxine	F018/001	Comment noted.
Hines, Maxine	F018/002	There was an announcement placed in the La Grande local paper two days prior to the public meeting. DOE recognizes that in this particular case the announcement should have occurred earlier. However, the meeting was announced earlier in both the Portland and Pendleton papers. For the revised draft HSW EIS, a similar procedure will be followed. Information will be sent to anyone who requested information, attended a public meeting, or submitted comments on the first draft.
Hines, Maxine	F018/004	Please see the response to comment F018-3.
Jasseys, Ruth	L029/001	Continued storage at Hanford is considered safer than other alternatives. Dispersal of the radioactive waste currently stored at Hanford to other offsite locations would be expensive and would likely expose the public and occupational workers to additional risks beyond those posed by storage at Hanford.
Jasseys, Ruth	L029/004	The Nevada Test Site is one of the locations that DOE plans to use for management and disposal of nuclear wastes.
Jones, Rhoda	L058/003	The Nevada Test Site is one of the locations that DOE plans to use for management and disposal of nuclear wastes.
Juergens, Kathleen	L077/006	DOE's funding from year-to-year has remained fairly constant. There are a number of cleanup activities ongoing at Hanford or being contemplated. Many of these cleanup activities require an EIS and hence the need for public input. Public input often shapes the design and implementation of cleanup at Hanford. In addition, DOE is continually trying to make the most effective use of its cleanup dollars by developing (with input and guidance from its regulatory partners and public interest groups and individuals) new cleanup methods and approaches.
Knight, Paige	PDA018/002	DOE considers public input a valuable and critical step in the NEPA process. DOE solicited input from regulators, tribal nations and members of the public over a three-month comment period on the first draft HSW EIS. Both oral and written comments were received at public meetings. Written comments were also accepted by conventional and electronic mail. Comments were provided on several common topics including: coordination with other environmental impact statements and DOE activities; alternatives and activities to analyze; waste types and volumes to analyze; public health, environmental consequences; transportation risk, and public involvement and government agency consultation. DOE has responded to each comment in the following sections of this document.

Table 3.2. (contd)

Source	Comment	Response
Knight, Paige	PDA018/003	Shipments of radioactive waste to Hanford have been suspended pending the outcome of litigation by the State of Washington against DOE.
Letterman, M. K.	MP003-103/003	The Yucca Mountain site, if and when it becomes operational, will be the nation's repository for high-level radioactive wastes. Transuranic wastes that are not high-level wastes, and which meet stringent waste acceptance criteria, are destined for the Waste Isolation Pilot Plant in New Mexico. Hanford, Nevada Test Site, and certain other major DOE sites will be used for management and disposal of LLW and MLLW.
Logan, Leslie	PDA031/001	Thank you for your comments. The purpose of these public meetings were to discuss the processes that the DOE outlined in the HSW EIS. In that context, no decisions had been made. The DOE strives to maintain an open channel of communication with all interested parties, including the public. These public meetings are only part our extensive outreach program. Your participation and the participation of everyone that attended the public meeting is what makes the outreach program successful.
Martin, Betty L.	L007/003	The DOE does not use facilities in the State of Oregon for nuclear waste disposal. Under provisions of the Low-Level Radioactive Waste Policy Act, low level waste generated in the State of Oregon is sent to the US Ecology facility in Washington.
Maser, Marlene	L036/002	Thank you for your comment. In reviewing and revising the HSW EIS, a substantial amount of checking and re-checking was conducted.
Mass Letter	ML001/003	The U.S. Department of Energy (DOE) is committed to cleaning up the Hanford Site in accordance with the Tri-Party Agreement (TPA) and applicable environmental requirements under federal and state laws and regulations. Chapter 6 of this HSW EIS identifies potential statutory and regulatory requirements that may apply to the proposed action and alternatives, including Resource Conservation and Recovery Act (RCRA) and State Dangerous Waste Regulations under the Hazardous Waste Management Act (see Section 6.3 of the HSW EIS). Section 6.19 addresses permits required to construct and operate treatment, storage, and disposal facilities related to the alternatives.
Mass Postcard	MP003/000	Each MP003 postcard received has unique comments. See the individual MP003 documents (MP003-001, MP003-002, etc.) for comments and responses.
Mays, Ed	SEA040/002	Thank you for your comments. Waste management activities evaluated in the HSW EIS are an integral part of the cleanup mission at Hanford and other DOE sites. Although some of the waste is referred to in the EIS as “newly generated,” the

Table 3.2. (contd)

Source	Comment	Response
		majority of waste forecast for management at Hanford consists of radioactive and hazardous material that currently exists at contaminated sites or facilities. When those sites are remediated or the facilities are decommissioned and demolished, contaminated materials from the cleanup become "newly generated" waste. Without facilities to treat and dispose of those materials in compliance with regulatory requirements, their impact on the environment and the risk to human health would ultimately be much greater.
McCracken, Mary	F021/002	Comments noted.
Miniszewski, Gary	L073/008	Thank you for your comment. Information on the geology and hydrology at the Hanford site is contained in Section 4.0 of the HSW EIS and references for that section.
Mitzner, Karen B.	F046/001	Hanford has experienced a number of environmental impacts as a result of its nuclear defense production mission that began in 1943. Clean-up of the resulting nuclear waste contamination has been difficult due to the radiological hazards and technological limitations for managing highly radioactive materials in the accessible environment. Hanford, like many Superfund sites, may never be restored to fully pristine environmental conditions.
Mitzner, Karen B.	F046/003	Hanford is considered to be in an area of relatively low seismic activity. It is also considered to be in an arid climate, based on its average annual precipitation of 6.8 inches per year.
Moore, Jennifer	SEA020/002	The U.S. Department of Energy (DOE) is committed to cleanup of the Hanford Site through the Tri-Party Agreement (TPA) process. A lot in the way of cleanup has happened at Hanford over the last decade. Portions of the site have already been cleaned up, removed from the National Priority List (NPL), and released for other uses (e.g., the 1100 Operable Unit). As part of the river corridor cleanup, DOE is remediating contaminated soil sites, decommissioning the plutonium production reactors and associated facilities, removing production reactor fuel from the K Basins to interim storage in the 200 Area, and treating groundwater contaminated by past operations. DOE is responsible for the cleanup of dozens of sites around the country. DOE's approach is to consolidate and dispose of radioactive waste from all its cleanup efforts in the safest and most cost-effective manner possible. Hanford and other sites would be available for the disposal of low-level waste and mixed low-level waste; WIPP is used for the disposal of TRU waste; Yucca Mountain is expected to be used for the disposal of high-level waste and spent nuclear fuel. Many more curies of waste will be sent offsite from Hanford than will be received from offsite. Analysis indicates that these wastes could be handled without complicating future remediations, or diverting

Table 3.2. (contd)

Source	Comment	Response
		resources or disposal capacity from other Hanford cleanup activities. DOE has added alternatives that include disposal of LLW in lined trenches with leachate collection systems (see Section 3.1). During the trench sampling, industrial hygienists conducted repeated air monitoring at the top of the PVC pipe above the trench—a required health and safety practice for all sampling activities to protect the workers from potentially being exposed during the sampling. After the carbon tetrachloride had been detected in the air at the bottom of the trench, industrial hygienists again monitored the trench to ensure that other workers who entered this area in the burial ground would not be exposed. The measurements for all "organics" in the air above the trench (including carbon tetrachloride and its decay products) showed readings ranging from "not detectable" to 4 ppm—well below the standard set by the Occupational Safety and Health Administration (OSHA) of 10 ppm per day during a 40-hour work week. Samples taken in the "breathing zone" did not show any level of organics. The monitoring at the surface of the trenches indicated that toxic vapors were not emanating from the vent risers.
Muller, Charles H.	MP001-51/002	Comment noted.
Nussbaum, Rudy	PDB007/003	The Fred Hutchinson Study did not find a definitive link between releases of Iodine 131 and thyroid cancer and other diseases in Eastern Oregon and Washington.
Parsons, Judy	F050/003	DOE contracts with trucking companies with specialized expertise in radioactive shipping to conduct offsite shipments of radioactive waste. DOE and the trucking companies are required to comply with Federal Acquisition Regulations (FARs) and DOE Acquisition Regulations (DEARs) in Title 48 of the Code of Federal Regulations that include, among other things, specific requirements and prohibitions about relationships between the Federal Government and potential contractors.
Ray, Mary Ann	LG005/003	Hanford's Single-Shell Tank System has been estimated to have leaked on the order of one million gallons. The HSW EIS presents the environmental and technical information concerning analyses for LLW, MLLW, and TRU waste stream management for the Hanford Site. Additional NEPA documentation for Hanford may be found at: http://www.hanford.gov/netlib/eis.asp.
Ruecker, William M.	F053/002	In some cases waste is and would continue to be encapsulated onsite (e.g., Category 3 LLW, and ILAW).
Sajovic, Sasha	SEA021/004	DOE concurs that the shipment of drums with potentially explosive methane was a problem. DOE had the incident thoroughly investigated by an independent party. In their investigative accident report, recommendations were made to

Table 3.2. (contd)

Source	Comment	Response
		DOE and its contractors on steps to implement to prevent a re-occurrence of a similar type incident. DOE has implemented the recommendations at all sites within the complex.
Sajovic, Sasha	SEA021/005	Radioactive waste shipments are carefully planned and executed in accordance with federal regulations. Among the regulations are requirements for shipping papers (i.e., manifests), labels, and placards. Additional information about these requirements can be found in Chapter 6 of the HSW EIS, Title 49 of the Code of federal Regulations, and DOE Order 460.2.
Sajovic, Sasha	SEA021/007	See Section 2.0 of the EIS where waste acceptance and inspection are described.
Schaefer, Susie	E003/001	The HSW EIS has been revised and reissued for public comment. Biological and ecological resources (vegetation, wildlife, aquatic ecology, and threatened and endangered species) potentially impacted by the proposed actions are assessed in Appendix I and summarized in Section 4.6 of this HSW EIS. Wildlife species evaluated and ecological resource impacts are summarized in Section 5.5 of this EIS. The natural vegetation is expected to be reestablished after closure of the disposal facilities and the borrow area. Potential mitigation measures for addressing ecological impacts are described in the Biological Resources Management Plan (BRMaP) and the Biological Resources Mitigation Strategy (BRMiS), which are discussed in Section 5.18 of this HSW EIS. The details of the groundwater impacts are presented in Section 5.3 and Appendix G. Cumulative impacts are discussed in see Sections 5.14 and Appendix L.
Schaefer, Susie	E003/003	The purpose of an EIS is to analyze and disclose the impacts of a proposed action and its reasonable alternatives thereby providing environmental input into the final decision regarding the action.
Schroeder, Ken	SEA046/002	The U.S. Department of Energy (DOE) is committed to cleanup of the Hanford Site through the Tri-Party Agreement (TPA) process. A lot in the way of cleanup has happened at Hanford over the last decade. Portions of the site have already been cleaned up, removed from the National Priority List (NPL), and released for other uses (e.g., the 1100 Operable Unit). As part of the river corridor cleanup, DOE is remediating contaminated soil sites, decommissioning the plutonium production reactors and associated facilities, removing production reactor fuel from the K Basins to interim storage in the 200 Area, and treating groundwater contaminated by past operations. DOE is responsible for the cleanup of dozens of sites around the country. DOE's approach is to consolidate and dispose of radioactive waste from all its cleanup efforts in the safest and most cost-effective manner possible. Hanford and other sites

Table 3.2. (contd)

Source	Comment	Response
		would be available for the disposal of low-level waste and mixed low-level waste; WIPP is used for the disposal of TRU waste; Yucca Mountain is expected to be used for the disposal of high-level waste and spent nuclear fuel. Many more curies of waste will be sent offsite from Hanford than will be received from offsite. Analysis indicates that these wastes could be handled without complicating future remediations, or diverting resources or disposal capacity from other Hanford cleanup activities. DOE has added alternatives that include disposal of LLW in lined trenches with leachate collection systems (see Section 3.1). Mitigation of groundwater impacts is discussed in Section 5.18.
Sharkey, Doug	HR003/003	The DOE has successfully treated and stabilized radioactive wastes with different formulations of concrete. Concrete treatments are used only for wastes that do not have levels of radiation high enough to cause the concrete formulation to deteriorate.
Shubert, Valerie	L080/001	The official comment period extended beyond the time requirements outlined in NEPA. There will be however, another public comment period for the revised draft HSW EIS that will give you an additional opportunity to respond. DOE will be seeking input from regulatory agencies, Tribal Nations, and members of the public on the revised draft HSW EIS being issued in response to comments received in writing and at public meetings. To ensure interested parties are able to respond to the revised document, DOE plans to conduct additional public meetings and provide an additional 45-day comment period. Notification letters will be sent to all individuals who either requested information, those who attended meetings, and/or provided comments.
Shubert, Valerie	L080/004	The HSW EIS uses conventions and terms that derive from solid waste management regulatory programs. Generally, waste management activities are delineated into waste generation, transportation, storage, treatment, and disposal.
Shubert, Valerie	L080/005	This is correct. The alternatives consist of many of the same activities.
Shubert, Valerie	L080/014	In the original development of DOE radioactive waste categories, Category 2 LLW was defined. However, this category resulted in only a small volume of waste. The previous Category 2 waste is now managed as Cat 3 LLW.
Shubert, Valerie	L080/019	The HSW EIS uses nomenclature that derive from solid waste management regulatory programs. The disposal definition derives from the federal RCRA statute and regulations.
Shubert, Valerie	L080/026	The definition provided comes from Section 11e.(2) of the Atomic Energy Act. Essentially all radioactive waste that is not high-level waste, TRU, or NORM is low-level waste. NORM,

Table 3.2. (contd)

Source	Comment	Response
		like many naturally occurring geologic materials, is generally too ubiquitous to effectively regulate.
Shubert, Valerie	L080/029	Decontamination activities associated with the Hanford defense production mission continue to decline.
Shubert, Valerie	L080/031	The term "treatment" in the HSW EIS derives from the regulatory definitions of treatment under federal and state hazardous waste management regulations. LLW that does not exhibit hazardous waste characteristics does not require treatment to meet RCRA land disposal restriction standards prior to disposal.
Shubert, Valerie	L080/032	The text in the draft HSW EIS has to balance brevity in the interest of readability against elaboration of many possible related details. Low-level radioactive wastes may be safely buried in shallow land disposal facilities, and high-level radioactive wastes require disposal in a deep geologic repository. Additional text and clarification has been provided in Section 1.7.3.3 of the revised draft HSW EIS.
Shubert, Valerie	L080/033	The term "reasonable" as it pertains to alternatives appears in NEPA regulations (40 CFR 1502 et al) and in NEPA guidance. The reasonable alternatives were developed in consideration of the P&N for agency action (Section 1 of HSW EIS). For description of alternatives, see Section 3.
Shubert, Valerie	L080/035	Hanford Site Solid Waste Acceptance Criteria (HSSWAC) cover a number of waste streams, each with its own acceptance criteria. Nonconforming wastes are those that do not meet applicable acceptance criteria. The HSSWAC (FH 2001) document is mentioned throughout the HSW EIS and is specifically identified as a reference.
Shubert, Valerie	L080/043	The cleanup of active DOE waste sites and facilities is regulated by DOE authority under the Atomic Energy Act, and is subject to the applicable provisions of the federal Resource Conservation and Recovery Act and the State of Washington Hazardous Waste Management Act. More specific provisions for cleanup of active Hanford waste sites and facilities are presented in the Tri-Party Agreement and in portions of the Hanford Dangerous Waste Management permit.
Shubert, Valerie	L080/044	The HSW EIS includes general descriptions of CERCLA and other authorities that can be used to respond to the release, or the threat of a release, of hazardous substances. Any site, facility, or vehicle used in the transportation or other management of a hazardous substance may experience the threat of such a release.
Shubert, Valerie	L080/045	Hanford's cribs were structurally reinforced pits used for past discharges of liquid effluents to the soil column, (also referred to as the vadose zone in the HSW EIS). French drains were in-ground pipes and pits that were similarly used to drain and

Table 3.2. (contd)

Source	Comment	Response
		discharge effluents from Hanford facilities. Discharges to ponds, cribs, French drains, and ditches ended in the early 1990s. Current effluent discharges are managed with more modern effluent treatment technologies. These waste sites no longer contain water and have undergone investigations, interim stabilization, and remediation as appropriate to prevent exposure and to prevent additional migration of contaminants into the soil column. Access to contaminated locations at Hanford is highly restricted.
Shubert, Valerie	L080/046	Inactive burial grounds are being managed as part of Hanford's CERCLA response activities. The general pattern of response for CERCLA sites includes assessment of available information, site characterization activities if necessary, followed by CERCLA process evaluations to determine whether additional response actions are needed.
Shubert, Valerie	L080/047	The ERDF is an important component of Hanford's restoration activities being performed under CERCLA authority. CERCLA wastes and ERDF operations are outside the scope of the draft HSW EIS, so it was only briefly discussed in Sections 1.5, 3.5, 4.2, and 5.14 of the first draft HSW EIS. The HSW EIS analyses have since been expanded to include a number of alternatives and activities that have been under discussion since the first draft HSW EIS was issued in April 2002. The revised draft HSW EIS includes additional alternatives for disposal of LLW, MLLW, ILAW and WTP melters in either independent or combined use facilities that comply with RCRA and state standards for disposal of hazardous wastes. A number of locations for the disposal facilities are considered, including the ERDF. Many of the alternative disposal facility configurations would include double liners, leachate collection systems, and RCRA compliant covers installed at or before closure.
Shubert, Valerie	L080/051	The defueled reactor compartments are shipped by barge up the Columbia River, and then taken by a special transport vehicle to the Hanford LLBG. They are still being shipped to Hanford.
Shubert, Valerie	L080/053	This document has been withdrawn from certain US government Internet sites due to terrorism and national security concerns. It is still available for review at the Hanford DOE Reading Room ((509) 372-7443). It is also available at http://www.globalsecurity.org/wmd/library/report/enviro/ea-0981.htm
Shubert, Valerie	L080/054	The stabilization is achieved by the removal of water from the solid fuel cores prior to packaging.

Table 3.2. (contd)

Source	Comment	Response
Shubert, Valerie	L080/056	Retrievable storage would mean that the waste could be readily retrieved at some time in the future. The plans for management of the low activity waste fraction have changed in the last year, and the immobilized low activity waste (ILAW) it is now included as one of the waste streams evaluated in the revised draft HSW EIS. The possible disposal locations for ILAW differ according to each of the alternatives evaluated in the revised draft HSW EIS.
Shubert, Valerie	L080/057	DOE NEPA decisions and actions regarding the cesium and strontium capsules are not within the scope of the Hanford Solid Waste EIS. At this time, there is no planned time frame for DOE making a decision about the cesium and strontium capsules. The time frame for decisions will depend on what DOE decisions are made regarding the Yucca Mountain site.
Shubert, Valerie	L080/087	In response to comments on the EIS, DOE provided an analysis of the radiological and nonradiological impacts of transporting TRU wastes from Hanford to WIPP. The analysis, presented in Section H.5.1 of the EIS, scaled the results presented in the WIPP SEIS-II to the TRU waste volumes projected in the Hanford Solid Waste EIS to be shipped from Hanford to WIPP. In addition, an analysis was conducted to determine the impacts in the States of Washington and Oregon of transporting wastes from offsite generators to Hanford and transporting TRU wastes to WIPP. This analysis is presented in Section H.5.2 of this EIS. Some of the references used in preparing the first draft HSW EIS have been withdrawn from the Internet because of national security concerns. Supporting documentation is available at the Hanford Reading Room in Richland, WA. Key references may also be available on compact disk (CD) or may be requested from the NEPA Document Manager. The Reference to the WIPP supplemental analysis is provided in the reference Section 2.3 and is available in the public document rooms. Since Transportation is a key part of the document and information related to Hanford is contained in numerous sections, a reference to a specific section is not appropriate. Both publc document rooms and many public library provide internet assess to those interested. Those with web access prefer web addresses to obtain information more quickly than having to go to the public document rooms.
Shubert, Valerie	L080/092	Additional information on waste volumes in contained in Section 3.4 Table 3.4. The table indicates that the waste volume is about 95 cubic meters of a total of 45,806. If the waste can not be send to WIPP without treatment, it will be treated, but new facilities will need to be established at significant expense to the taxpayers.

Table 3.2. (contd)

Source	Comment	Response
Shubert, Valerie	L080/132	The T Plant Complex meets all TPA requirements where the commitment or completion date has occurred. The M-91 requirements for the T Plant Complex are set out in Table 6.1 of the DEIS.
Shubert, Valerie	L080/157	Verification is discussed in sections 2.1.1 and 2.2.2.1.
Shubert, Valerie	L080/173	See page 2-20 where it was described.
Shubert, Valerie	L080/209	The non-conforming LLW stream is described in Section 2.1.1.4.
Shubert, Valerie	L080/211	Wastes from Hanford CERCLA activities are sent to ERDF. Other LLW and MLLW sources are described in Section 2.1 and Appendix C.
Shubert, Valerie	L080/221	The LLBG was initially designated by the Atomic Energy Commission as an area to be used for disposal of Hanford's radioactive wastes. Additional designations were made by DOE beginning in 1985 to address requirements under the Resource Conservation and Recovery Act statute.
Shubert, Valerie	L080/223	Appendix E of the draft HSW EIS provides the details of the air quality impact analysis. The estimates include diesel engines, propane-fired equipment, and fugitive dust sources. The details of the on-site traffic and transportation impacts are provided in Appendix H of the draft HSW EIS. The transportation impact analysis is based on estimates of accidents and fatalities rather than air emissions. DOE considers accidents and fatalities to be more meaningful metrics for estimating transportation impacts than vehicular air emissions.
Shubert, Valerie	L080/224	Table 3.5 of the first draft HSW EIS provided a high-level summary of some of the more significant impact estimates. Te-99 and I-129 were two groundwater contaminants of concern that were estimated to exceed regulatory benchmark maximum contaminant levels as a possible result of the proposed actions. Table 3.5 has been replaced with more extensive tabular impact summaries in the revised draft HSW EIS.
Shubert, Valerie	L080/225	The stated text in Table 3.5 was intended to represent the maximum estimated impacts on the Columbia River that might result from the proposed actions. The impacts are based on modeling of contaminant movement within disposal units and Hanford's hydrogeology. Variations in contaminant concentrations over time, with associated maximum and average concentrations, can be expected in source terms, in groundwater well locations, and in groundwater entering the Columbia River. Table 3.5 has been replaced with more extensive tabular impact summaries in the revised draft HSW EIS.

Table 3.2. (contd)

Source	Comment	Response
Shubert, Valerie	L080/227	Radioactive waste disposal areas at Hanford and other DOE sites will remain under restricted access government control indefinitely.
Shubert, Valerie	L080/228	Only major non-renewable resources were considered as important discriminators among the alternatives. Disposal of HSW would not contaminate water so it would not be useable. Bentonite clay and land have been added as non-renewable commitments.
Shubert, Valerie	L080/231	The DOE defines "design basis" as the set of requirements that bound the design of systems, structures, and components within its facilities. Design requirements include consideration of safety, plant availability, efficiency, reliability, and maintainability. Some aspects of the design basis are important to safety, although others are not. Design basis accidents (DBAs) are used in DOE safety analyses to provide the design parameters for release barriers and mitigating systems. The major categories of DBAs are internally initiated operational accidents (e.g., fires, explosions, spills, criticality); natural phenomena events for the site (e.g., earthquakes, tornadoes) that could affect the facility; and externally initiated, man-made events such as airplane crashes, transportation accidents, adjacent facility events, etc., that can either cause releases at the facility under examination or have a major impact on facility operations. The DOE also evaluates "beyond" DBAs to provide additional perspective. The insight from beyond DBA analyses has the potential for identifying additional facility features that could prevent or reduce severe beyond DBA consequences. In evaluations of beyond DBAs, it is understood that as frequencies become very low, little or no meaningful insight is attained. Operational beyond DBAs are operational accidents with more severe conditions or equipment failures than are estimated for the corresponding DBA. Natural phenomena beyond DBAs are defined by the frequency of the natural phenomena event itself (i.e., frequency of occurrence less than DBA frequency of occurrence). Beyond DBAs are not evaluated for external events.
Shubert, Valerie	L080/232	The scenario is not credible as the waste is below the depth of excavation. The condition of the asphalt is not relevant in this scenario.
Shubert, Valerie	L080/233	The evaluations in the draft HSW EIS are based on internationally accepted standard methods for radiological and chemical exposure health impact analysis. Evaluations based on estimates of potential long-term mutational effects were not used in the draft HSW EIS.

Table 3.2. (contd)

Source	Comment	Response
Shubert, Valerie	L080/234	As indicated in Table 3.5 footnote (b), it is reasonable to expect that native shrub-steppe habitat will eventually re-establish itself on the LLBG closure caps. The risks to biota or humans resulting from this expected outcome were not used as a basis for evaluation in the draft HSW EIS.
Shubert, Valerie	L080/235	The fiscal cost provides one perspective along with the environmental impacts for making decisions, which we need to do as part of this EIS.
Shubert, Valerie	L080/239	Water contours are shown on Figures 4.16 and 4.17. This comment does not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/240	Details regarding population demographics in this area are documented in the Hanford Site National Environmental Policy Act (NEPA) Characterization document (Neitzel 2002). These details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/242	All documents referenced in the HSW EIS are publicly available at the DOE Reading Room in Richland, Washington.
Shubert, Valerie	L080/245	Details regarding unique habitats and the presence of cultural resources in this area are documented in the Hanford Site Environmental Report 2001 (Poston et al 2002) and the Hanford Site National Environmental Policy Act (NEPA) Characterization document (Neitzel 2002). These details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/249	The intent of the transfer of DOE ownership to Port of Benton ownership was to support future economic development. Additional details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/250	Construction was halted due to issues regarding need for power. For additional details, contact Energy Northwest. Additional details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/251	For additional details on other industrial options, contact Energy Northwest. These details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/253	Volpentest is a personal name. This comment does not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/255	Results of research conducted on the Fitzner-Eberhardt Arid Lands Ecology Reserve Unit are publicly available at the DOE Reading Room in Richland, Washington.
Shubert, Valerie	L080/257	For additional information, contact the FWS.
Shubert, Valerie	L080/262	Water is discharged into the ground from a pipe. These details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/264	Bentonite is an absorptive and colloidal clay. These details do not change the assessment documented in the HSW EIS.

Table 3.2. (contd)

Source	Comment	Response
Shubert, Valerie	L080/266	The text was modified for clarification. Effluents that are added to the pond must meet all benchmark maximum contaminant levels.
Shubert, Valerie	L080/267	Barriers over the contamination sources are used to inhibit radionuclide transport to the surface environment through deep rooted plants, such as Russian thistle, or burrowing insects and animals. There are components in the RCRA modified Subtitle C Cap, illustrated in Section 2.2.3.2, to exclude burrowing insects/mammals and deep rooted plants from coming in contact with the waste. Details regarding surface contamination are documented in the Hanford Site Environmental Report 2001(Poston et al 2001). These details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/268	The number and size or contaminated areas vary from year to year for several reasons: stabilization of areas of known contamination, discovery of new areas of contamination, and/or ongoing improvement of the geographical measurements of contaminated areas. Details regarding surface contamination are documented in the Hanford Site Environmental Report 2001(Poston et al 2001). These details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/269	The contaminated soil and/or vegetation is removed. All contaminated areas may be susceptible to contamination migration and are surveyed at least annually to document the current radiological status. Details regarding surface contamination are documented in the Hanford Site Environmental Report 2001(Poston et al. 2002). These details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/270	Tumbleweed and rabbitbrush are deep-rooted species and can become radiologically contaminated by the uptake of below ground contaminants through their root systems. Herbicide application is intended to halt vegetation growth before the uptake occurs. In addition, areas of surface contamination are posted, monitored, and surveyed at least annually to document their radiological status. Details regarding biological control programs are documented in the Hanford Site Environmental Report 2001(Poston et al 2002). These details do not change the assessment documented in the HSW EIS.

Table 3.2. (contd)

Source	Comment	Response
Shubert, Valerie	L080/271	Barriers over the contamination sources are used to inhibit radionuclide transport to the surface environment through deep rooted plants, such as Russian thistle, or burrowing insects and animals. There are components in the RCRA modified Subtitle C Cap, illustrated in Section 2.2.3.2, to exclude burrowing insects/mammals and deep rooted plants from coming in contact with the waste. Details regarding surface contamination are documented in the Hanford Site Environmental Report 2001(Poston et al 2001). These details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/276	Additional details regarding weather are found in Hanford Site Climatological Data Summary 2000 With Historical Data (Hoitink et al 2001) and the Hanford Site National Environmental Policy Act (NEPA) Characterization document (Neitzel 2002). These details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/277	Details regarding the climate and meteorology of this area are documented in the Hanford Site Climatological Data Summary 2000 With Historical Data (Hoitink et al 2001) and the Hanford Site National Environmental Policy Act (NEPA) Characterization document (Neitzel 2002). These details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/279	Additional details regarding air monitoring are found in the Hanford Site National Environmental Policy Act (NEPA) Characterization document (Neitzel 2002). These details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/280	Additional details regarding weather are found in Hanford Site Climatological Data Summary 2000 With Historical Data (Hoitink et al 2001) and the Hanford Site National Environmental Policy Act (NEPA) Characterization document (Neitzel 2002). These details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/285	The joint frequency distributions were measured at two different heights (9.1 m and 60 m [30 ft and 197 ft]. The text has been modified for clarification.
Shubert, Valerie	L080/287	The U.S. EPA has issued regulations (40 CFR 50) setting national ambient air quality standards. In addition, the State has established standards for total suspended particulates, radionuclides, and fluorides. The Hanford Site is in compliance with all national and State ambient air quality standards. Additional details regarding air quality in this area are documented in the Hanford Site National Environmental Policy Act (NEPA) Characterization document (Neitzel 2002). These details do not change the assessment documented in the HSW EIS.

Table 3.2. (contd)

Source	Comment	Response
Shubert, Valerie	L080/289	Standards for emissions of radionuclides from DOE facilities have been established by EPA (40 CFR Part 61) and Washington State (WAC-173-480 and WAC 246-247). Emissions may not exceed quantities that would result in a dose of 10 mrem in a year to a maximally exposed member of the public. Additional details regarding air quality in this area are documented in the Hanford Site National Environmental Policy Act (NEPA) Characterization document (Neitzel 2002). These details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/290	The U.S. EPA has issued regulations (40 CFR 50) setting national ambient air quality standards. The State has also established standards for total suspended particulates, radionuclides, and fluorides. In addition, Washington state has established more stringent standards for sulfur dioxide. The Hanford Site is in compliance with all national and State ambient air quality standards. Additional details regarding air quality in this area are documented in the Hanford Site National Environmental Policy Act (NEPA) Characterization document (Neitzel 2002). These details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/292	Footnotes are in standard U.S. DOE format. This comment does not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/293	For further information on the standards, see WAC-173-480-040. These details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/294	Additional information on the source of contaminants is found in the Hanford Site Environmental Report 2001 (Poston et al 2002). These additional details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/295	The 100, 400, and 600 areas have no non-radioactive emission sources of regulatory concern. Details regarding non-radioactive emission sources of regulatory concern are documented in the Hanford Site Environmental Report 2001(Poston et al 2001). These details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/300	Releases are a composite of calculated estimates of toxic air pollutants, excluding ammonia. Additional information on the source of contaminants is found in the Hanford Site Environmental Report 2001 (Poston et al 2002). These additional details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/302	The Cold Vacuum Drying facility is where fuel from the K Basins is prepared for storage. These details do not change the assessment documented in the HSW EIS.

Table 3.2. (contd)

Source	Comment	Response
Shubert, Valerie	L080/303	The potential air pathway dose from stack emissions to a maximally exposed individual was calculated to be 0.22 mrem per year. Emissions may not exceed quantities that would result in a dose of 10 mrem in a year to a maximally exposed member of the public. These details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/305	The first occurrences of "NM and ND" are marked with a footnote citation. Including separate footnotes for each of them does not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/308	Cumulative doses include background radiation. These details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/331	Nonhuman uses are described in detail in Section 4.6. This comment does not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/353	Results are published in the Hanford Site Environmental Report 2001 (Poston et al 2002). All documents referenced in the HSW EIS are publicly available at the DOE Reading Room in Richland, Washington.
Shubert, Valerie	L080/356	Prospective technetium-99 and iodine-129 groundwater impacts are discussed in a number of locations in the draft HSW EIS and its appendices, and the discussions of results and impacts do not lend themselves to cross-reference annotation as requested. Table 3.5 has been replaced with a more extensive set of impact summary tables in the revised draft HSW EIS.
Shubert, Valerie	L080/368	Carbon tetrachloride is disposed of using RCRA approved procedures. These details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/387	NAVD88 is the North American Vertical Datum of 1988. This comment does not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/396	An estimated 150 square mile plume of contaminated groundwater exists underneath the Hanford site. This plume of contamination resulted from the release of an estimated 450 billion gallons of liquid radionuclide and hazardous waste since 1944, 346 billion gallons of which were released in the 200-East and 200-West areas.
Shubert, Valerie	L080/405	The table has been revised to include the footnotes on both pages. However, this comment does not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/423	'Biological and Ecological Resources' is standard NEPA terminology. This comment does not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/432	Figure 4.20 and its legend are intentionally arranged to first show the vegetation distribution to the reader and then provide its explanatory legend. The arrangement in revised draft HSW EIS is the same.

Table 3.2. (contd)

Source	Comment	Response
Shubert, Valerie	L080/466	The surveys were conducted for presence/absence with no assessment of viability of populations. These details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/475	Comment noted.
Shubert, Valerie	L080/484	Non-farm wage refers to income generated from non-farm business. Proprietor income refers to income from individual owned businesses. These details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/501	The table was revised. However, this comment does not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/503	The table was revised. However, this comment does not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/504	The population in Benton and Franklin counties are quite similar to those found within Washington. The population in Benton and Franklin counties under the age of 35 is 53.1 percent, compared to 49.4 percent for Washington State. In general, the population of Benton and Franklin counties is somewhat younger than that of Washington. The 0- to 14-yr old age group accounts for 25.6 percent of the total bi-county population as compared to 21.3 percent for Washington. In 2000, the 65-yr old and older age group constituted 9.8 percent of the population of Benton and Franklin counties, compared to 11.2 percent for Washington. These details do not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/516	Currently, there is a park-and-ride system available. This comment does not change the assessment documented in the HSW EIS.
Shubert, Valerie	L080/518	The exact location of the barricade does not change the assessment documented in the HSW EIS.
Sims, Lynn	F057/002	The DEIS uses risk as one means to evaluate impacts of Hanford solid waste management activities. Risks associated with facilities and storage activities were described in Section 5.11. On-site transportation impacts were evaluated in Appendix H and Section 5.8 of the first DEIS.
Stennard, Richard and Elaine	F083/004	The Yucca Mountain site, if and when it becomes operational, will be the nation's repository for high-level radioactive wastes. Transuranic wastes that are not high-level wastes, and which meet stringent waste acceptance criteria, are destined for the Waste Isolation Pilot Plant in New Mexico. Hanford, Nevada Test Site, and certain other major DOE sites will be used for management and disposal of LLW and MLLW.

Table 3.2. (contd)

Source	Comment	Response
Streib, Darol	MP003-102/001	The Yucca Mountain site, if and when it becomes operational, will be the nation's repository for high-level radioactive wastes. Transuranic wastes that are not high-level wastes, and which meet stringent waste acceptance criteria, are destined for the Waste Isolation Pilot Plant in New Mexico. Hanford, Nevada Test Site, and certain other major DOE sites will be used for management and disposal of LLW and MLLW.
Taney, Madeleine F.	MP003-092/001	What has been observed in the vadose zone beneath the Hanford tank farms were the results of leaks of large volumes of tanks wastes containing extreme geochemical conditions of pH and salt content. The enhanced migration of complexed cobalt-60 originated from a discharge sites in the B-BX-BY WMA that received large amounts of liquid wastes. LLBGs have not received tank wastes nor have they received large volumes of liquid wastes and there is no evidence that similar geochemical conditions persists beneath LLBGs.
Teal, Joseph	L015/002	The strategies for dealing with TRU wastes, complex-wide and at Hanford, have been presented for public review in other NEPA documents, notably the 1997 WM PEIS (see WM PEIS Volume I, Chapter 8), the Waste Isolation Pilot Plant Supplemental EIS (DOE/EIS-0026-S-2) and in related DOE records of decision (see Appendix A of the CRD for a summary of DOE RODs). Related NEPA documents are summarized in Section 1.5 of the revised draft HSW EIS. According to the Section 3.2 of the 1987 Disposal of Hanford Defense High-Level, Transuranic, and Tank Wastes EIS, there are 24 TRU-contaminated soil sites with an estimated TRU inventory of 20,000 Ci (0.02 Mci). These sites include the cribs, trenches, ponds, ditches, French drains, settling tanks, and one unplanned release. The estimate volume of these contaminated soil sites is 32,000 cubic meters, and the estimated weight is 58,000 metric tons. Pre-1970 buried suspect TRU, essentially all contaminated solid waste disposed between 1944 and 1970, has an estimated TRU inventory of 33,000 Ci (0.033 Mci). The estimated volume of these contaminated sites (waste and soil) is 110,000 cubic meters, and the estimated weight is 200,000 metric tons. The current estimated inventory of retrievable Hanford TRU is approximately 0.4 Mci, and the estimated inventory from off-site sources is expect to be 0.1 Mci. A total estimated TRU inventory of 0.5MCi is to be sent to WIPP.
Thompson, June	MP003-002/001	Due to the radioactive properties of the waste, and the prospect of long-term erosion from weather elements, DOE radioactive wastes are usually buried significantly below grade. DOE maintains a significant radiological and hazardous chemical monitoring network for groundwater, surface water, air, and biological resources.

Table 3.2. (contd)

Source	Comment	Response
Tipperman, Mark	LG007/004	DOE is cognizant of the concern of Native Americans and others regarding operations at Hanford. Extensive effort has been made to provide quantitative analysis of potential impacts. It is DOE policy to comply with the Endangered Species Act.
Unidentified	F066/001	Comments noted.
Unidentified	F068/002	Comments noted.
Unidentified	F069/001	Thank you for your comments. The standard time for comments at a public meeting is three minutes. Written comments are the best way to voice an opinion and to receive a response. At the HSW-EIS public meetings commenters, representing themselves or various organizations, were heard on a first-come, first-served basis based on a sign-up sheet at the registration table. All were encouraged to provide written versions of their oral comments for the record. Oral comments were recorded by a court reporter and are part of the official draft HSW EIS public meeting record. Printed information was available, and opportunities were provided before each meeting for informal discussion about the DOE proposed action and the scope and content of the draft HSW EIS. Forms for those who wished to submit written comments instead of or in addition to oral statements, also were provided. Not all commenters were able to speak because of time limitations at the facility in Portland and so another forum was held.
Unidentified	F070/001	Comments noted.
Unidentified	F072/002	Comments noted.
Unidentified Speaker	LG019/002	DOE will be seeking input from regulatory agencies, Tribal Nations, and members of the public on the revised draft HSW EIS being issued in response to comments received in writing and at public meetings. To ensure interested parties are able to respond to the revised document, DOE plans to conduct additional public meetings and provide an additional 45-day comment period. Notification letters will be sent to all individuals who either requested information, those who attended meetings, and/or provided comments.
Unidentified Speaker	PDA017/003	Shipment of offsite waste to Hanford has occurred in the past and is continuing.

Table 3.2. (contd)

Source	Comment	Response
Unidentified Speaker	PDA017/004	Approximately 20,818 m^3 of low level waste (lower bound estimate) is considered offsite waste coming to Hanford (lower bound estimate) and 198,845 m3 (upper bound estimate). Mixed Low Level Waste is 100 m3 (lower bound) and 140,334 m3 (upper bound). For TRU waste there would be 57 m^3. See Appendix C of the first draft HSW EIS for additional details. These volumes may change in the revised draft HSW EIS. It should also be pointed out that these are volumes used to "bound" the alternative evaluations and does not mean that these wastes volumes will actually be the amount imported to Hanford.
Unidentified Speaker	PDA017/007	Approximately 20,818 m^3 of low level waste (lower bound estimate) is considered offsite waste coming to Hanford (lower bound estimate) and 198,845 m^3 (upper bound estimate). Mixed Low Level Waste is 100 m^3 (lower bound) and 140,334 m3 (upper bound). For TRU waste there would be 57 m3. See Appendix C of the first draft HSW EIS for additional details. These volumes may change in the revised draft HSW EIS. It should also be pointed out that these are volumes used to "bound" the alternative evaluations and does not mean that these wastes volumes will actually be the amount imported to Hanford.
Unidentified Speaker	PDA017/010	The Record of Decision (ROD) is published in the Federal Register and is a matter of public record. The exact text of the ROD is available on the DOE website (http://www.em.doe.gov/em30/llwrod.html)
Unidentified Speaker	PDA017/011	DOE reaches its conclusions after full public involvement and disclosure. These decisions, often in the form of Records of Decision or RODs, are then published in the Federal Register.
Unidentified Speaker	SEA001/001	Radioactive wastes are managed based on their regulatory status and based on their radionuclear and hazardous characteristics. For example, high-level radioactive waste has regulatory status as DOE high-level radioactive mixed waste under the Atomic Energy Act, and it also has regulatory status as hazardous waste under the Resource Conservation and Recovery Act. The required treatment for HLW is vitrification. Waste characteristics and treatment requirements are determined based on the source of the material, characterization data, or process knowledge.
Unidentified Speaker	SEA001/003	Germany sends spent fuel from its 19 nuclear power plants abroad for reprocessing under contracts that oblige it to take back the waste for storage.
Unidentified Speaker	SEA001/009	Thank you for your comments and questions. Regarding the public comment period and when a comment is no longer accepted, as long as the comment is postmarked the last day of the comment period it is still accepted for review and response.

Table 3.2. (contd)

Source	Comment	Response
Unidentified Speaker	SEA001/010	Earthquakes and seismicity were discussed in Section 4.4.4 of the first DEIS. Though there are active fault lines throughout the State and the northwest region in general, Hanford is in an area considered to be of low seismic activity. DOE's extensive programs for safety and safeguarding of nuclear materials consider a variety of possible worst-case scenarios. Safety analysis reports and other safety documentation were used to assess impacts resulting from reasonably foreseeable catastrophic events. Volcanic activity from Mt. Rainier is not expected to impact Hanford or its waste management activities.
Unidentified Speaker	SEA001/011	For in-trench grouting the process involves placing the waste on a cement pad or on spacers, installing reinforcement steel and forms around the waste and covering the waste with fresh concrete. Steel fibers are incorporated into the concrete to increase its strength. DOE has a number of structural engineers at Hanford that it calls upon in the design and building of the grouting systems. Most of these engineers have advanced degrees and years of experience on the job.
Unidentified Speaker	SEA001/012	Thank you for your comments. The HSW EIS has not been finalized and the ROD has not been published yet. The purpose of these public meetings were to discuss the processes that the DOE outlined in the HSW EIS. In that context, no decisions had been made. Opportunity for Public comment will be provided on this revised drat HSW EIS.
Unidentified Speaker	SEA001/014	Thank you for your comments. The DOE acts as an agency that represents the policy of the current administration. The DOE is tasked with following the NEPA process for all of its Environmental Impact Statements. DOE considers all comments it receives in preparing an EIS, including this EIS.
Unidentified Speaker	SEA001/015	EPA rates all draft environmental impacts statements issued by federal agencies. Further information on the rating process is available at: http://www.epa.gov/compliance/nepa/comments/ratings.html.
Unidentified Speaker	SEA001/026	DOE was given the authority to manage LLW by Congress and may not have the legal authority to delegate this responsibility to another agency. Specifically, LLW is waste that contains radioactive material and that does not fall under any other DOE classification of radioactive waste. DOE manages LLW and other radioactive waste under the authority of the Atomic Energy Act (AEA) of 1954 (42 USC 2011 et seq.). Categories of LLW and other requirements for disposal of LLW at Hanford are described in the Hanford Site Solid Waste Acceptance Criteria (HSSWAC).

Table 3.2. (contd)

Source	Comment	Response
Unidentified Speaker	SEA001/034	Presence alone of threatened or endangered species or critical habitat does not necessitate formal consultation under the Endangered Species Act. The U.S Fish and Wildlife Service (FWS) letter of April 23, 2002, (see Appendix I) states that "...if a listed species is likely to be affected by the project, the involved Federal agency should request Section 7 consultation.…" According to the FWS Endangered Species Consultation Handbook, formal consultation is necessary 1) after the action agency determines that the proposed action may affect listed species or critical habitat, or 2) National Marine Fisheries Service (NMFS) or FWS does not concur with the action agency's finding that the proposed action is not likely to adversely affect the listed species or critical habitat. There are no threatened or endangered species or critical habitat in any of the terrestrial habitats to be disturbed under any of the alternatives in this HSW EIS (see Appendix I). Thus, because no threatened or endangered species or critical habitat are likely to be adversely affected, there is no basis for initiating formal consultation with either NMFS or FWS. Regarding documentation for State-listed species of concern we assume the comment meant the Washington State Department of Fish and Wildlife not the U.S. Fish and Wildlife Service. Table 4.12 in this EIS identifies the Washington State-listed animal species of concern. This information was obtained from the website: www.wa.gov/wdfw/. Based on information provided subsequently from the Washington State Department of Fish and Wildlife (US FWS February 2002), this EIS has been updated.
Unidentified Speaker	SEA002/002	Thank you for your comments. The DOE strives to maintain an open channel of communication with all interested parties, including the public. These public meetings are only part our extensive outreach program. Your participation and the participation of everyone that attended the public meeting is what makes the outreach program successful.
Walworth, Frieda S.	MP001-53/001	During waste retrieval, drums that are not intact will be overpacked in new drums.
Walworth, Frieda S.	MP003-130/002	The U.S. Department of Energy (DOE) is committed to cleanup of the Hanford Site through the Tri-Party Agreement (TPA) process. A lot in the way of cleanup has happened at Hanford over the last decade. Portions of the site have already been cleaned up, removed from the National Priority List (NPL), and released for other uses (e.g., the 1100 Operable Unit). As part of the river corridor cleanup, DOE is remediating contaminated soil sites, decommissioning the plutonium production reactors and associated facilities, removing production reactor fuel from the K Basins to interim storage in the 200 Area, and treating groundwater contaminated by past operations. DOE is responsible for the cleanup of dozens of sites around the country.

Table 3.2. (contd)

Source	Comment	Response
		DOE's approach is to consolidate and dispose of radioactive waste from all its cleanup efforts in the safest and most cost-effective manner possible. Hanford and other sites would be available for the disposal of low-level waste and mixed low-level waste; WIPP is used for the disposal of TRU waste; Yucca Mountain is expected to be used for the disposal of high-level waste and spent nuclear fuel. Many more curies of waste will be sent offsite from Hanford than will be received from offsite. Analysis indicates that these wastes could be handled without complicating future remediations, or diverting resources or disposal capacity from other Hanford cleanup activities. DOE has added alternatives that include disposal of LLW in lined trenches with leachate collection systems (see Section 3.1). During waste retrieval, drums that are not intact will be overpacked in new drums.
Winn, Norman L.	L057/001	DOE plans to vitrify the contents of the underground waste storage tanks at Hanford. The vitrification process will be conducted in accordance with Federal and Washington State regulatory requirements. Although some plutonium is in the waste tanks at Hanford, most of the radioactive waste is strontium and cesium.
Winn, Norman L.	L057/008	EPA did a special study of organics and radionuclides (EPA 910-R-02-006) for a limited number of fish samples on the Hanford Reach. Fish were collected from the Hanford Reach of the Columbia River, artificial ponds on the Hanford Site, and from the upper Snake River and analyzed for radionuclides. The levels of radionuclides in fish tissue from Hanford Reach of the Columbia River and the ponds on the Hanford Site were similar to levels in fish from the Snake River. Cancer risks were estimated for consumption of fish that were contaminated with radionuclides. These estimates of risks were not combined with the potential risks from other chemicals, such as PCBs (Aroclors and dioxin-like PCBs), chlorinated dioxins and furans, and a limited number of pesticides. The potential cancer risks from consuming fish collected from Hanford Reach and the artificial ponds on the Hanford Site were similar to cancer risks in fish collected from the upper Snake River. These risks were small relative to the estimated risks associated with radiation from naturally occurring background sources, to which everyone is exposed. EPA reported that the Yakima River and the Hanford Reach of the Columbia River tended to have higher concentrations of organic chemicals than other study sites. EPA's study reported that the chemicals and or chemical classes that contributed the most to cancer risk for most of the resident fish were PCBs (Aroclors and dioxin-like PCBs), chlorinated dioxins and furans, and a limited number of pesticides. For most of the anadromous fish, the chemicals that contributed the

Table 3.2. (contd)

Source	Comment	Response
		most to cancer risk were PCBs (Aroclors and dioxin-like PCBs), chlorinated dioxins and furans, and arsenic. Agricultural runoff and non-Hanford-related industrial activities are believed to be major contributors of these organic chemicals.
Woodhouse, Woody	RL002/008	DOE evaluates the performance of each disposal facility in detail to ensure the facility meets the DOE Performance Assessment requirements. If groundwater contamination in excess of DOE limits were predicted by the Performance Assessment process, changes in the waste acceptance criteria would be made to limit disposal of the waste causing the groundwater contamination. The waste would require further treatment prior to disposal or would be stored until a method was found to treat or dispose of the waste.
Zotter, Michael	MP003-024/003	The U.S. Department of Energy (DOE) is committed to cleanup of the Hanford Site through the Tri-Party Agreement (TPA) process. A lot in the way of cleanup has happened at Hanford over the last decade. Portions of the site have already been cleaned up, removed from the National Priority List (NPL), and released for other uses (e.g., the 1100 Operable Unit). As part of the river corridor cleanup, DOE is remediating contaminated soil sites, decommissioning the plutonium production reactors and associated facilities, removing production reactor fuel from the K Basins to interim storage in the 200 Area, and treating groundwater contaminated by past operations. DOE is responsible for the cleanup of dozens of sites around the country. DOE's approach is to consolidate and dispose of radioactive waste from all its cleanup efforts in the safest and most cost-effective manner possible. Hanford and other sites would be available for the disposal of low-level waste and mixed low-level waste; WIPP is used for the disposal of TRU waste; Yucca Mountain is expected to be used for the disposal of high-level waste and spent nuclear fuel. Many more curies of waste will be sent offsite from Hanford than will be received from offsite. Analysis indicates that these wastes could be handled without complicating future remediations, or diverting resources or disposal capacity from other Hanford cleanup activities. DOE has added alternatives that include disposal of LLW in lined trenches with leachate collection systems (see Section 3.1). A discussion of the impacts of transporting waste to and from Hanford through the states of Oregon and Washington has been added to this HSW EIS. A discussion of the storage of offsite TRU waste at Hanford pending its disposal at WIPP is also included in this HSW EIS (see Section 5 and its associated appendixes). In response to comments, DOE included a discussion of the potential impacts of deliberate acts of sabotage or terrorist attacks in Section 5.8 and Appendix H of this EIS.

3.7 Generic Responses to Other Organizations and Individuals

Table 3.3. Generic Responses to Organizations and Individuals

CommentIDs				Subject/Response
F005/4 F073/1 F074/3 L004/1 L010/7 L012/2 L012/8 L013/2 L020/7 L023/1 L023/7	L025/1 L026/1 L043/6 L045/1 L045/7 L091/6 L091/21 L097/9 L106/31 L106/44 L106/45	ME001/1 ME001/7 ML002-04/2 ML002-17/2 MP003-005/1 MP003-012/1 MP003-036/2 MP003-044/1 MP003-065/2 MP003-067/2 MP003-071/2 MP003-075/1 MP003-132/2	RL003/3 SEA001/30 SEA010/9 SEA023/5 SEA025/2	Gen001: Additional Alternatives - Disposal alternatives, groundwater impacts, cumulative impacts Additional disposal alternatives have been analyzed. Section 5.3 and Appendix G have been revised to present additional information on groundwater impacts. Section 5.14 and Appendix L have been revised to present additional information on cumulative impacts.
F001/3	L097/22	PDB018/3	SEA016/3	Gen002: Additional Alternatives - LLW disposal potential impacts, cumulative impacts Additional disposal alternatives, including alternatives for the disposal of low-level waste, have been analyzed. The potential environmental impacts of these additional alternatives are presented in Section 5 and related appendixes. Information on the potential impacts of transporting waste through Washington and Oregon has been added to Section 5.8 and Appendix H.
E018/4 F079/6 HR002/4	L010/5 L011/7 L020/6 L023/6 L026/6 L045/6 L049/5	L056/4 L063/6 L064/6 L085/5 L091/4 L097/7 L102/23	PDA005/6 RL008/4	Gen003: Additional Alternatives - LLW disposal, potential impacts, long term stewardship, commercial disposal Additional disposal alternatives, including alternatives for the disposal of low-level waste, have been analyzed. Potential environmental impacts of these additional alternatives are presented in Section 5 and related appendixes. Further discussion of long-term stewardship and commercial disposal has been added.
L054/9	SEA018/6			Gen004: Additional Alternatives - No mixed waste in unlined trenches The HSW EIS does not include any alternatives for the disposal of mixed waste in unlined trenches.
L091/42 L091/43 L106/6	PDA024/3	SEA006/1		Gen005: Additional Alternatives - Potential impacts, cumulative impacts, commercial disposal Additional disposal alternatives have been analyzed. The potential environmental impacts of these additional alternatives are presented in Section 5 and related appendixes. Further information on cumulative impacts has been added to Section 5.14 and Appendix L. Further discussion of commercial disposal has also been added to this HSW EIS.

Table 3.3. (contd)

CommentIDs				Subject/Response
E004/3 E012/1 E017/1 E020/1 E033/1 E045/2 F016/16 F061/4 F083/1 HR003/2	L001/2 L012/7 L020/1 L048/3 L070/3 L092/7 L097/61 L098/10 L104/15 L104/23 L104/48 L104/51 L106/53 LG004/2 LG012/5	ML002/4 ML002-25/1 MP001-17/1 MP002-03/2 MP003-009/1 MP003-018/1 MP003-021/1 MP003-021/2 MP003-030/3 MP003-073/2 MP003-095/2 MP003-116/2 MP003-141/2	P011/1 SEA001/2 SEA001/4 SEA001/6 SEA001/24 SEA013/6 SEA035/3	Gen006: Additional Alternatives - Potential impacts, cumulative impacts, transportation impacts Additional disposal alternatives, including alternatives for the disposal of low-level waste, have been analyzed. The potential environmental impacts of these additional alternatives are presented in Section 5 and related appendixes. Further information on cumulative impacts has been added to Section 5.14 and Appendix L. Information on the potential impacts of transporting waste through Washington and Oregon has been added to Section 5.8 and Appendix H.
L003/2 L038/2 L102/10	MP001-58/1 MP003-020/1 MP003-030/1 MP003-061/2 MP003-069/1 MP003-080/3	PDA004/1 PDA005/4 PDA028/1	SEA023/2 SEA041/1	Gen007: Additional Analysis - Human health and environmental impacts, movement of contaminants to Columbia River, impacts on Columbia River Additional analysis of human health and environmental impacts has been done. Section 5 and related appendixes have been revised to present this additional information. For all waste alternatives analyzed in this HSW EIS, DOE has analyzed the movement of contaminants through groundwater to the Columbia River. In all cases, it found that the water quality of the Columbia River would be indistinguishable from the current river background levels. The concentrations of all the constituent contaminants were well below benchmark maximum contaminant levels at a hypothetical well located near the Columbia River. The impacts of groundwater reaching the river are discussed in Section 5.3 and Appendix G. See also Sections 5.11 and Appendixes F and G.
E004/7 F015/1	L080/226 L091/11 L091/35 L097/39 L102/11 L104/37 L106/12 L106/32 L106/47 LG004/3 LG012/2	MP001-61/1 PDA022/4 PDA033/11	RL007/4 SEA013/14 SEA028/8	Gen008: Biological and Ecological Resource Impacts - Natural vegetation reestablishment, mitigation measures for ecological impacts, BRMiS Biological and ecological resources (vegetation, wildlife, aquatic ecology, and threatened and endangered species) potentially impacted by the proposed actions are assessed in Appendix I and summarized in Section 4.6 of this HSW EIS. Wildlife species evaluated and ecological resource impacts are summarized in Section 5.5 of this EIS. The natural vegetation is expected to be reestablished after closure of the disposal facilities and the borrow area. Potential mitigation measures for addressing ecological impacts are described in the Biological Resources Management Plan (BRMaP) and the Biological Resources Mitigation Strategy (BRMiS), which are discussed in Section 5.18 of this HSW EIS.

Table 3.3. (contd)

CommentIDs				**Subject/Response**
F072/1 HR002/9	L097/29 L097/30 L097/31 L098/12 MP003-029/2	RL003/7 RL003/8 RL003/9 RL003/10 RL004/4	SEA010/8 SEA010/16 SEA025/1 SEA042/2	Gen009: Carbon Tetrachloride - Recent incident During the trench sampling, industrial hygienists conducted repeated air monitoring at the top of the PVC pipe above the trench—a required health and safety practice for all sampling activities to protect the workers from potentially being exposed during the sampling. After the carbon tetrachloride had been detected in the air at the bottom of the trench, industrial hygienists again monitored the trench to ensure that other workers who entered this area in the burial ground would not be exposed. The measurements for all "organics" in the air above the trench (including carbon tetrachloride and its decay products) showed readings ranging from "not detectable" to 4 ppm—well below the standard set by the Occupational Safety and Health Administration (OSHA) of 10 ppm per day during a 40-hour work week. Samples taken in the "breathing zone" did not show any level of organics. The monitoring at the surface of the trenches indicated that toxic vapors were not emanating from the vent risers.
E049/4 F005/3 F009/1 F009/2 F011/3 F011/4	HR001/2 HR002/2 HR006/2 HR009/3 HR010/1 HR010/4 HR012/1 HR015/5 HR017/3	L080/376 L097/10 L097/53 L097/54 L097/55 L097/56	P001/1 RL005/3 SEA028/10	Gen010: Columbia River - Analytical consistency with CRCIA methods The approach taken in the HSW EIS is consistent with the methods, characteristics, and controls associated with a composite analysis as described by the Columbia River Comprehensive Impact Assessment (CRCIA) team. The analysis modules included in the SAC parallel those identified by CRCIA and were developed through work group meetings that included regulator and stakeholder participation. Several key modules were adopted directly from the CRCIA including the module used to calculate human health impacts (the HUMAN code) and the module used to calculate impacts to ecological species (the ECEM code).
E005/1 E006/2 E007/2 E007/4 E011/4 E014/4 E021/3 E026/2 E028/2 E030/1 E035/4 E049/1 E049/2 F002/5 F016/20	L001/7 L012/9 L017/2 L017/3 L021/3 L023/12 L028/3 L030/1 L034/3 L035/2 L039/2 L040/5 L042/2 L044/2 L049/3 L053/1	ME001-04/1 ME001-05/1 ME001-07/2 ME001-09/3 ML002-02/2 ML002-24/1 MP001-25/1 MP001-29/1 MP001-30/1 MP001-37/1 MP001-38/1 MP001-44/1 MP001-49/1 MP001-50/1 MP001-50/2 MP001-51/1	MP003-068/2 MP003-068/3 MP003-074/1 MP003-074/2 MP003-084/1 MP003-087/1 MP003-087/2 MP003-088/1 MP003-104/3 MP003-105/2 MP003-115/3 MP003-124/2 MP003-125/3 MP003-130/3 MP003-137/3 MP003-140/2	Gen011: Columbia River - Evaluation of impacts, health impacts to downstream populations DOE shares your concerns about protecting the Columbia River. Analysis of alternatives assesses the impacts on water quality in the Columbia River. For all waste alternatives analyzed in this HSW EIS, DOE has analyzed the movement of contaminants through groundwater to the Columbia River. In all cases, it found that the water quality of the Columbia River would be indistinguishable from the current river background levels. The concentrations of all the constituent contaminants were well below benchmark maximum contaminant levels at a hypothetical well located near the Columbia River. The health impacts on downstream populations of groundwater reaching the Columbia River are discussed in Section 5.11

Table 3.3. (contd)

CommentIDs				Subject/Response
F024/3 F055/9 F062/2 F071/1 F074/4 F079/2 F079/5 F083/5 F084/6 F086/1 HR004/4	L054/10 L057/11 L061/3 L067/3 L067/5 L077/3 L091/38 L093/3 L104/21 LG004/1 LG004/7 LG006/11 LG009/1 LG011/1 LG018/1	MP002-20/2 MP003-001/2 MP003-007/1 MP003-007/2 MP003-015/1 MP003-017/1 MP003-018/3 MP003-018/4 MP003-023/2 MP003-025/3 MP003-037/1 MP003-048/2 MP003-052/1 MP003-057/2 MP003-060/1	MP003-146/2 MP003-147/1 MP003-150/1 P005/1 PDA005/5 PDA031/9 PDB007/2 PDB012/7 SEA013/17 SEA018/7 SEA029/2 SEA039/1	and Appendix of this HSW EIS. The ecological impacts are discussed in Section 5.5 and Appendix I. The impacts of groundwater reaching the river are discussed in Section 5.3 and Appendix G. Additional discussion of uncertainties has been included in Section 3.5. Additional discussion of mitigation measures appears in Section 5.18.
F042/3 F071/2 F071/3 HR002/10 HR014/1	L009/5 L018/6 L046/2 L073/6 L080/452 L093/7 L093/8 L104/1	MP003-016/3 MP003-050/3 MP003-051/2 MP003-053/3 MP003-064/2 MP003-078/2 MP003-081/2 MP003-117/2 MP003-117/4 MP003-120/3 MP003-123/2 MP003-133/3	PDA009/3 PDA033/3 PDA033/4 RL001/9 RL001/10 RL007/2 SEA010/11 SEA011/2 SEA011/3 SEA036/2 SEA042/11	Gen012: Columbia River - Evaluation of impacts, health impacts to downstream populations, EPA survey DOE shares your concerns about protecting the Columbia River. Analysis of alternatives assesses the impacts on water quality in the Columbia River. For all waste alternatives analyzed in this HSW EIS, DOE has analyzed the movement of contaminants through groundwater to the Columbia River. In all cases, it found that the water quality of the Columbia River would be indistinguishable from the current river background levels. The concentrations of all the constituent contaminants were well below benchmark maximum contaminant levels at a hypothetical well located near the Columbia River. The health impacts on downstream populations of groundwater reaching the Columbia River are discussed in Section 5.11 and Appendix of this HSW EIS. The ecological impacts are discussed in Section 5.5 and Appendix I. The impacts of groundwater reaching the river are discussed in Section 5.3 and Appendix G. Additional discussion of uncertainties has been added to Section 3.5. Additional discussion of mitigation measures appears in Section 5.18. According to Columbia River Basin Fish Contaminant Survey (U.S. Environmental Protection Agency 1996-1998, EPA 910-R-02-006, Region 10, Seattle, WA), contaminants contributing to the potential risks for Native Americans were polychlorinated biphenyls (PCBs) (Aroclors and dioxin-like PCBs), chlorinated dioxins and furans, a limited number of pesticides (DDT and others), mercury, and arsenic. These chemicals occur in the Columbia River as a result of agricultural and industrial operations (pulp and paper plants, for example) and are unlikely to be of Hanford origin. These chemicals would not exist in wastes proposed for future disposal at Hanford, or if present, would be treated to reduce their mobility and toxicity.

Table 3.3. (contd)

CommentIDs				Subject/Response
E017/5 E019/3 E029/5 F027/5 F032/3 F047/5	L054/4 L084/6 L106/24 L106/54	ME001-09/1 RL003/24	SEA001/25 SEA001/35 SEA002/1	Gen013: Cost Evaluation - Costs for maintenance of leachate collection, monitoring of cap, groundwater monitoring, compliance requirements DOE has developed and analyzed the costs for each alternative considered in this HSW EIS. The scope of the cleanup activity is expected to include maintenance of the leachate collection system, monitoring of the cap performance, and maintenance of passive administrative controls (signs/postings). Groundwater monitoring is conducted according to DOE Orders, the Resource Conservation and Recovery Act (RCRA) permit, and Tri-Party Agreement (TPA) requirements for the disposal areas, and will be expanded as necessary according to agreements between DOE and regulatory agencies to support future waste management operations. DOE is committed to meeting environmental regulations and standards now and in the future. The U.S. Environmental Protection Agency (EPA) and Ecology (under the Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] and RCRA) require monitoring, reporting, and record keeping. Thus, there is a legal requirement that DOE, or its successor entities, meet these requirements.
E004/9 E025/2 F016/9 F025/2 F057/3	L097/28 L098/14 L104/18 LG028/1	MP003-034/2 MP003-140/1 MP003-140/3	SEA002/4 SEA028/14	Gen014: Costs - Additional information on costs Additional information on costs has been included in this EIS. The wastes under consideration for shipment to Hanford are generated by DOE programs at other locations, and DOE is therefore responsible for costs associated with these wastes.
E018/5	L011/8 L098/15 L102/24 L104/52	RL003/30		Gen015: Costs - Charging generators for full cost of disposal Discussion of charging generators the full cost for disposal has been added (see Appendix N). Alternatives for the use of lined trenches for the disposal of low-level waste have also been added (see Section 3.1).

Table 3.3. (contd)

CommentIDs				Subject/Response
E004/2 E023/2 E028/1 F016/10 L011/1 L057/10 L091/8	L097/17 L098/16 L102/2 L102/17 L104/19 L104/22 L104/24 L104/26 L104/30	L104/43 L106/46 MP003-028/4 P003/2 PDA005/2 RL003/20 RL005/2	RL008/1 RL008/6 SEA013/16 SEA023/11 SEA028/5 SEA041/2 SEA041/7	Gen016: Cumulative Impacts - Additional Information, transportation impacts Further information on cumulative impacts has been added to Section 5.14 and Appendix L. Information on the potential impacts of transporting waste through Washington and Oregon has been added to Section 5.8 and Appendix H.
SEA041/6				Gen017: Cumulative Impacts - Activities in Hanford PMP The cumulative impacts discussion in Section 5.14 has been expanded. Some activities described in the Hanford Performance Management Plan could be implemented based on current NEPA documentation, still others are not ripe for evaluation and would require further planning, analysis, and preparation of additional NEPA documentation.
HR011/1	L073/2	L097/27		Gen018: DOE - Responsibilities for cleanup around the country, curies to be disposed at Hanford, charging disposal costs to generators DOE is responsible for the cleanup of dozens of sites around the country. DOE's approach is to consolidate and dispose of radioactive waste from all its cleanup efforts in the safest and most cost-effective manner possible. Hanford and other sites would be available for the disposal of low-level waste and mixed low-level waste; WIPP is used for the disposal of TRU waste; Yucca Mountain is expected to be used for the disposal of high-level waste and spent nuclear fuel. Many more curies of waste will be sent offsite from Hanford than will be received from offsite. Discussion of charging generators the full cost for disposal has been added (see Appendix N).
L049/2	PDA031/2			Gen019: DOE - Responsibilities for cleanup around the country, WIPP, Yucca Mountain, curies to be disposed at Hanford DOE is responsible for the cleanup of dozens of sites around the country. DOE's approach is to consolidate and dispose of radioactive waste from all its cleanup efforts in the safest and most cost-effective manner possible. Hanford and other sites would be available for the disposal of low-level waste and mixed low-level waste; WIPP is used for the disposal of TRU waste; Yucca Mountain is expected to be used for the disposal of high-level waste and spent nuclear fuel. Many more curies of waste will be sent offsite from Hanford than will be received from offsite.

Table 3.3. (contd)

CommentIDs				Subject/Response
F061/6 F061/8 L080/182 L084/5 LG007/6	ML001/1 ML002/3 MP003-006/1 MP003-126/2	PDA020/7	SEA001/20 SEA010/2 SEA042/9 SEA046/3	Gen020: DOE - Responsibilities for cleanup around the country, WIPP, Yucca Mountain, curies to be disposed at Hanford, wastes can be managed without complicating future remediations, diverting resources, disposal capacity DOE is responsible for the cleanup of dozens of sites around the country. DOE's approach is to consolidate and dispose of radioactive waste from all its cleanup efforts in the safest and most cost-effective manner possible. Hanford and other sites would be available for the disposal of low-level waste and mixed low-level waste; WIPP is used for the disposal of TRU waste; Yucca Mountain is expected to be used for the disposal of high-level waste and spent nuclear fuel. Many more curies of waste will be sent offsite from Hanford than will be received from offsite. Analysis indicates that these wastes could be handled without complicating future remediations, or diverting resources or disposal capacity from other Hanford cleanup activities.
	MP001-35/1 MP002-27/4 MP003-120/4	PDA003/2		Gen021: FFTF Issues regarding the Hanford Fast Flux Test Facility are not within the scope of the HSW EIS NEPA review process.

Table 3.3. (contd)

CommentIDs				Subject/Response
E017/3	F081/4	L012/6 L080/418 L080/421 L097/59 L097/60 L097/64		Gen022: Groundwater Monitoring - Groundwater monitoring, LLW disposal in lined trenches Groundwater monitoring is conducted according to DOE Orders, the Resource Conservation and Recovery Act (RCRA) permit, and Tri-Party Agreement (TPA) requirements for the disposal areas. Groundwater monitoring will be expanded as necessary according to agreements between DOE and regulatory agencies to support future waste management operations. DOE has added alternatives for evaluation in the HSW EIS that include disposal of LLW in lined trenches with regulatory-compliant leachate collection systems (see Section 3.1).
F014/2 F019/3 HR015/4 HR021/2 L027/4	PDA003/11 PDA025/3 PDA028/2 PDA028/8 PDA030/6 PDB012/4 PDB013/3 PDB017/3	MP002-19/1 RL002/2	SEA001/18 SEA001/19 SEA038/1	Gen023: Hanford Cleanup - DOE commitment and progress The U.S. Department of Energy (DOE) is committed to cleanup of the Hanford Site through the Tri-Party Agreement (TPA) process. A lot in the way of cleanup has happened at Hanford over the last decade. Portions of the site have already been cleaned up, removed from the National Priority List (NPL), and released for other uses (e.g., the 1100 Operable Unit). As part of the river corridor cleanup, DOE is remediating contaminated soil sites, decommissioning the plutonium production reactors and associated facilities, removing production reactor fuel from the K Basins to interim storage in the 200 Area, and treating groundwater contaminated by past operations.
E003/4 E008/1 E010/2 E019/2 E029/1 F002/2 F010/6 F014/1 F016/1 F016/2 F024/4 F026/1 F026/3 F027/1 F037/3 F041/4 F054/4 F059/1 F064/4 F065/4	L036/3 L040/6 L041/1 L053/3 L054/2 L054/6 L060/1 L069/5 L070/1 L070/4 L073/4 L074/1 L077/2 L077/5 L077/8 L080/3 L097/36 L104/50	ML002-17/4 ML002-23/1 MP001-09/1 MP001-22/1 MP001-42/1 MP001-45/1 MP001-57/1 MP001-57/2 MP002-06/1 MP002-06/2 MP002-25/1 MP003-004/1 MP003-016/2 MP003-033/1 MP003-040/2 MP003-048/1 MP003-051/1 MP003-062/1 MP003-074/3	PDA015/1 PDA020/4 PDA022/5 PDA023/5 PDA024/5 PDA027/2 PDA031/3 PDA033/12 PDA034/2 PDB006/3 PDB013/2 PDB015/4 RL003/25 SEA001/13 SEA005/2 SEA006/3 SEA009/1	Gen024: Hanford Cleanup - DOE commitment and progress, DOE responsibilities around the country, DOE waste management approach, WIPP, Yucca Mountain, curies disposed at Hanford, no resource diversion The U.S. Department of Energy (DOE) is committed to cleanup of the Hanford Site through the Tri-Party Agreement (TPA) process. A lot in the way of cleanup has happened at Hanford over the last decade. Portions of the site have already been cleaned up, removed from the National Priority List (NPL), and released for other uses (e.g., the 1100 Operable Unit). As part of the river corridor cleanup, DOE is remediating contaminated soil sites, decommissioning the plutonium production reactors and associated facilities, removing production reactor fuel from the K Basins to interim storage in the 200 Area, and treating groundwater contaminated by past operations. DOE is responsible for the cleanup of dozens of sites around the country. DOE's approach is to consolidate and dispose of radioactive waste from all its cleanup efforts in the safest and most cost-effective manner possible. Hanford and other sites would be available for the disposal of low-level waste and mixed low-level waste;

Table 3.3. (contd)

CommentIDs				Subject/Response
F082/4 HR002/8 L007/4 L014/4 L034/2 L034/5	LG003/4 LG010/1 LG010/2 LG011/3 ME001-02/2 ML002-05/1	P004/4 P006/3 P009/1 PDA001/1 PDA002/2 PDA003/4 PDA003/9 PDA003/10 PDA008/3	SEA010/5 SEA015/2 SEA019/3 SEA021/6 SEA028/1	Mountain is expected to be used for the disposal of high-level waste and spent nuclear fuel. Many more curies of waste will be sent offsite from Hanford than will be received from offsite. Analysis indicates that these wastes could be handled without complicating future remediations, or diverting resources or disposal capacity from other Hanford cleanup activities.
L027/3	LG006/9			Gen025: Hanford Cleanup - DOE commitment and progress, DOE responsibilities around the country, DOE waste management approach, WIPP, Yucca Mountain, curies disposed at Hanford, no resource diversion, transportation discussion cleanup of the Hanford Site through the Tri-Party Agreement (TPA) process. A lot in the way of cleanup has happened at Hanford over the last decade. Portions of the site have already been cleaned up, removed from the National Priority List (NPL), and released for other uses (e.g., the 1100 Operable Unit). As part of the river corridor cleanup, DOE is remediating contaminated soil sites, decommissioning the plutonium production reactors and associated facilities, removing production reactor fuel from the K Basins to interim storage in the 200 Area, and treating groundwater contaminated by past operations. DOE is responsible for the cleanup of dozens of sites around the country. DOE's approach is to consolidate and dispose of radioactive waste from all its cleanup efforts in the safest and most cost-effective manner possible. Hanford and other sites would be available for the disposal of low-level waste and mixed low-level waste; WIPP is used for the disposal of TRU waste; Yucca Mountain is expected to be used for the disposal of high-level waste and spent nuclear fuel. Many more curies of waste will be sent offsite from Hanford than will be received from offsite. Analysis indicates that these wastes could be handled without complicating future remediations, or diverting resources or disposal capacity from other Hanford cleanup activities. Additional discussion of transportation has been added in Section 2.2.4, Section 5.8, and Appendix H in Volumes I and II of this HSW EIS. A discussion of transporting waste to and from Hanford through the states of Oregon and Washington is included.

Table 3.3. (contd)

CommentIDs				Subject/Response
E001/1	HR007/2	MP001-16/1	MP003-097/3	Gen026: Hanford Cleanup - DOE commitment and
E004/1	HR008/2	MP001-26/1	MP003-107/1	progress, DOE responsibilities for sites around the
E010/4		MP001-33/1	MP003-108/1	country, DOE waste management approach, WIPP, Yucca
	HR017/1	MP001-39/1	MP003-113/2	Mountain, curies to be disposed at Hanford, wastes can be
E025/1		MP001-53/2	MP003-118/1	managed without complicating future remediations, diver
E034/5	L003/3	MP002-07/4	MP003-124/1	
E046/3		MP002-09/1	MP003-131/2	
	L006/1	MP002-15/1	MP003-132/1	cleanup of the Hanford Site through the Tri-Party
	L012/4	MP002-21/1	MP003-136/1	Agreement process. A lot in the way of cleanup has
F002/4	L020/3	MP002-26/2	MP003-136/3	happened at Hanford over the last decade. Portions of the
F006/3		MP003-001/1	MP003-138/2	site have already been cleaned up, removed from the
	L023/3		MP003-139/2	National Priority List, and released for other uses. As part
F010/2	L025/2	MP003-008/1		of the river corridor cleanup, DOE is remediating
F015/8	L026/3	MP003-010/1	MP003-142/3	contaminated soil sites, decommissioning the plutonium
F019/2		MP003-011/5	MP003-144/1	production reactors and associated facilities, removing
	L035/1		MP003-148/1	reactor fuel from the K Basins located near the Columbia
F028/5	L037/1	MP003-019/2		River, and treating groundwater contaminated by past
F031/2	L045/3	MP003-022/1	MP003-151/2	operations. DOE is responsible for the cleanup of dozens
F033/2		MP003-024/2		of sites around the country. DOE's approach is to
F045/2	L051/1	MP003-026/2	P002/1	consolidate and dispose of radioactive waste from all its
F047/3	L064/3	MP003-034/1		cleanup efforts in the safest and most cost-effective
F052/1	L085/3	MP003-041/1	P006/1	manner possible. Hanford and other sites would be
F053/3	L097/5	MP003-045/1	P008/1	available for the disposal of low-level waste and mixed
	L104/54	MP003-046/2		low-level waste. The Waste Isolation Pilot Plant in New
F062/1		MP003-050/2		Mexico is used for the disposal of transuranic waste. It is
F063/2	ME001-03/1	MP003-050/4	RL005/8	expected that Yucca Mountain in Nevada will be used for
F076/2	ME001-09/2	MP003-057/1	RL006/3	the disposal of spent nuclear fuel and high-level waste.
F076/3	ML001/2	MP003-058/2	RL007/5	The total amount of radioactivity expected to leave
F080/3	ML002/6	MP003-064/1		Hanford is much greater than the amount of radioactivity
	ML002-10/	MP003-072/1	SEA018/3	expected to come to Hanford. About 400 MCi of
	ML002-14/3	MP003-076/1		radioactivity are currently onsite. About 375 MCi are
	ML002-16/1	MP003-080/4		expected to be shipped to the Waste Isolation Pilot Plant
				in New Mexico, Yucca Mountain in Nevada, and other
				places. Less than 10 MCi would come to Hanford even if
				all the offsite waste evaluated in this HSW EIS were to
				come to Hanford. Additional disposal alternatives,
				including alternatives for the disposal of low-level waste,
				have been analyzed. The potential environmental impacts
				of these additional alternatives are presented in Section 5
				and related appendixes.

Table 3.3. (contd)

CommentIDs				Subject/Response
E010/1 E017/9 E020/3 E023/1 F043/2 F055/8 F081/11 F084/7	HR005/1 L018/7	MP001/6 MP001-02/2 MP001-04/1 MP001-06/1 MP001-27/1 MP001-31/2 MP002-04/1 MP002-27/5 MP003-027/2 MP003-089/3 MP003-101/1	P010/4 PDA006/1 PDA014/2	Gen027: Hanford Cleanup - DOE commitment and progress, DOE responsibilities for sites around the country, WIPP, Yucca Mountain The U.S. Department of Energy (DOE) is committed to cleanup of the Hanford Site through the Tri-Party Agreement process. A lot in the way of cleanup has happened at Hanford over the last decade. Portions of the site have already been cleaned up, removed from the National Priority List, and released for other uses. As part of the river corridor cleanup, DOE is remediating contaminated soil sites, decommissioning the plutonium production reactors and associated facilities, removing reactor fuel from the K Basins located near the Columbia River, and treating groundwater contaminated by past operations.DOE is responsible for the cleanup of dozens of sites around the country. DOE's approach is to consolidate and dispose of radioactive waste from all its cleanup efforts in the safest and most cost-effective manner possible. Hanford and other sites would be available for the disposal of low-level waste and mixed low-level waste. The Waste Isolation Pilot Plant in New Mexico is used for the disposal of transuranic waste. It is expected that Yucca Mountain in Nevada will be used for the disposal of spent nuclear fuel and high-level waste.
E027/1 E027/2 E029/2 E031/2 E033/2 E034/2 E034/3 E035/3 E037/2 E040/2 E042/1 E042/3 E046/5 E050/2 E051/3 F001/1 F005/6 F015/6 F016/8 F027/3 F029/3 F032/2 F034/3 F038/3 F039/3	L024/2 L024/3 L025/3 L026/4 L028/4 L031/2 L032/2 L033/1 L040/2 L042/1 L043/2 L043/5 L045/4 L046/1 L048/1 L051/5 L052/1 L053/5 L055/1 L057/9 L059/1 L059/2 L060/3 L060/4 L062/2 L063/1 L063/4	MP002-13/1 MP002-16/1 MP002-17/1 MP002-18/1 MP003-002/3 MP003-003/2 MP003-008/3 MP003-010/3 MP003-013/1 MP003-015/2 MP003-016/4 MP003-018/2 MP003-021/4 MP003-023/1 MP003-025/1 MP003-025/2 MP003-027/3 MP003-029/1 MP003-030/2 MP003-031/1 MP003-032/1 MP003-036/1 MP003-037/2 MP003-039/3 MP003-040/1 MP003-044/2 MP003-049/1	MP003-116/1 MP003-119/3 MP003-119/4 MP003-123/1 MP003-125/2 MP003-126/1 MP003-127/3 MP003-133/1 MP003-134/1 MP003-136/2 MP003-137/1 MP003-141/1 MP003-143/2 MP003-146/1 MP003-148/2 MP003-149/1 P003/5 P004/2 P004/3 P006/2 P010/2 P011/2 PDA008/1 PDA022/10 PDA027/4	Gen028: Hanford Cleanup - DOE commitment and progress, DOE responsibilities for sites around the country, WIPP, Yucca Mountain, radioactivity disposed at Hanford, wastes can be managed without complicating future remediations The U.S. Department of Energy (DOE) is committed to cleanup of the Hanford Site through the Tri-Party Agreement (TPA) process. A lot in the way of cleanup has happened at Hanford over the last decade. Portions of the site have already been cleaned up, removed from the National Priority List (NPL), and released for other uses (e.g., the 1100 Operable Unit). As part of the river corridor cleanup, DOE is remediating contaminated soil sites, decommissioning the plutonium production reactors and associated facilities, removing production reactor fuel from the K Basins to interim storage in the 200 Area, and treating groundwater contaminated by past operations. DOE is responsible for the cleanup of dozens of sites around the country. DOE's approach is to consolidate and dispose of radioactive waste from all its cleanup efforts in the safest and most cost-effective manner possible. Hanford and other sites would be available for the disposal of low-level waste and mixed low-level waste; WIPP is used for the disposal of TRU waste; Yucca Mountain is expected to be used for the disposal of high-level waste and spent nuclear fuel. Many more curies of

Table 3.3. (contd)

CommentIDs				Subject/Response
F041/1	L064/1	MP003-050/1	PDA028/7	waste will be sent offsite from Hanford than will be received from offsite. Analysis indicates that these wastes could be handled without complicating future remediations, or diverting resources or disposal capacity from other Hanford cleanup activities. DOE has added alternatives that include disposal of LLW in lined trenches with leachate collection systems (see Section 3.1).
F047/4	L064/4	MP003-052/3	PDA031/4	
F055/2	L066/4	MP003-053/2	PDA033/8	
F056/2	L067/7	MP003-054/2	PDB008/1	
F057/4	L069/2	MP003-058/1	PDB017/5	
F060/2	L070/2	MP003-063/1		
F065/3	L084/10	MP003-065/1	RL001/5	
F067/1	L093/2	MP003-066/2	RL001/17	
F071/4	L098/20	MP003-067/1	RL003/1	
F071/6	L102/14	MP003-067/3	RL004/1	
F073/4	L104/16	MP003-073/1	RL006/2	
F077/3		MP003-076/4		
F079/3	LG006/6	MP003-077/2	SEA007/1	
F082/3	LG011/2	MP003-080/1	SEA010/1	
F084/3	LG012/4	MP003-080/2	SEA010/3	
	LG019/3	MP003-081/1	SEA013/3	
HR021/1		MP003-083/2	SEA016/4	
	ME001/4	MP003-088/2	SEA017/2	
L003/4	ME001/10	MP003-092/2	SEA019/2	
L003/5	ME001-06/1	MP003-093/1	SEA023/8	
L004/4	ME001-06/2	MP003-094/2	SEA025/4	
L005/4		MP003-096/4	SEA025/5	
L008/1	ML002/1	MP003-102/2	SEA027/3	
L008/3	ML002-01/1	MP003-102/3	SEA028/13	
L009/4	ML002-04/1	MP003-103/1	SEA033/1	
L010/3	ML002-10/2	MP003-104/1	SEA035/2	
L010/6	ML002-11/2	MP003-105/1	SEA039/6	
L011/3	ML002-17/1	MP003-108/2	SEA041/3	
L011/6	ML002-19/2	MP003-110/1	SEA043/2	
L012/5	MP001/2	MP003-111/1	SEA045/1	
L013/4	MP001/5	MP003-111/2	SEA048/5	
L016/1	MP001-03/1	MP003-111/4	SEA049/3	
L017/1	MP001-36/1	MP003-113/1		
L019/2	MP002-03/1	MP003-114/4		
L020/4	MP002-07/2	MP003-115/1		
L023/4	MP002-10/1	MP003-115/2		
L023/10				

Table 3.3. (contd)

CommentIDs				Subject/Response
MP003-009/2	MP003-117/1	MP003-122/1		Gen029: Hanford Cleanup - DOE commitment and progress, DOE responsibilities for sites around the country, WIPP, Yucca Mountain, radioactivity disposed at Hanford, wastes can be managed without complicating future remediations, alternatives, mixed waste disposal The U.S. Department of Energy (DOE) is committed to cleanup of the Hanford Site through the Tri-Party Agreement (TPA) process. A lot in the way of cleanup has happened at Hanford over the last decade. Portions of the site have already been cleaned up, removed from the National Priority List (NPL), and released for other uses (e.g., the 1100 Operable Unit). As part of the river corridor cleanup, DOE is remediating contaminated soil sites, decommissioning the plutonium production reactors and associated facilities, removing production reactor fuel from the K Basins to interim storage in the 200 Area, and treating groundwater contaminated by past operations. DOE is responsible for the cleanup of dozens of sites around the country. DOE's approach is to consolidate and dispose of radioactive waste from all its cleanup efforts in the safest and most cost-effective manner possible. Hanford and other sites would be available for the disposal of low-level waste and mixed low-level waste; WIPP is used for the disposal of TRU waste; Yucca Mountain is expected to be used for the disposal of high-level waste and spent nuclear fuel. Many more curies of waste will be sent offsite from Hanford than will be received from offsite. Analysis indicates that these wastes could be handled without complicating future remediations, or diverting resources or disposal capacity from other Hanford cleanup activities. DOE has added alternatives that include disposal of LLW in lined trenches with leachate collection systems (see Section 3.1). The HSW EIS does not evaluate alternatives for disposal of mixed low-level waste unlined trenches.

Table 3.3. (contd)

CommentIDs				Subject/Response
L077/7	MP003-097/2	PDA003/8		Gen030: Hanford Cleanup - DOE commitment and progress, DOE responsibilities for sites around the country, WIPP, Yucca Mountain, radioactivity disposed at Hanford, wastes can be managed without complicating future remediations, transportation, TRU The U.S. Department of Energy (DOE) is committed to cleanup of the Hanford Site through the Tri-Party Agreement (TPA) process. A lot in the way of cleanup has happened at Hanford over the last decade. Portions of the site have already been cleaned up, removed from the National Priority List (NPL), and released for other uses (e.g., the 1100 Operable Unit). As part of the river corridor cleanup, DOE is remediating contaminated soil sites, decommissioning the plutonium production reactors and associated facilities, removing production reactor fuel from the K Basins to interim storage in the 200 Area, and treating groundwater contaminated by past operations. DOE is responsible for the cleanup of dozens of sites around the country. DOE's approach is to consolidate and dispose of radioactive waste from all its cleanup efforts in the safest and most cost-effective manner possible. Hanford and other sites would be available for the disposal of low-level waste and mixed low-level waste; WIPP is used for the disposal of TRU waste; Yucca Mountain is expected to be used for the disposal of high-level waste and spent nuclear fuel. Many more curies of waste will be sent offsite from Hanford than will be received from offsite. Analysis indicates that these wastes could be handled without complicating future remediations, or diverting resources or disposal capacity from other Hanford cleanup activities. DOE has added alternatives that include disposal of LLW in lined trenches with leachate collection systems (see Section 3.1). A discussion of the impacts of transporting waste to and from Hanford through the states of Oregon and Washington has been added to this HSW EIS. A discussion of the storage of offsite TRU waste at Hanford pending its disposal at WIPP is also included in this HSW EIS (see Section 5 and its associated appendixes).

Table 3.3. (contd)

CommentIDs				Subject/Response
L007/1 L014/1 LG024/1 MP003-089/1 MP003-089/2	PDA010/3 PDA026/3 PDA033/2 PDB011/5 PDB012/3 PDB012/8	RL001/2 RL001/8 RL002/4 RL003/12 RL003/13 RL003/14 RL003/15 RL003/21 RL003/22 RL003/23	SEA011/5 SEA019/1 SEA019/4 SEA020/3	Gen031: Hanford Cleanup - DOE commitment and progress, offsite TRU management, WM PEIS, evaluation of Hanford-only waste The U.S. Department of Energy (DOE) is committed to cleanup of the Hanford Site through the Tri-Party Agreement (TPA) process. A lot in the way of cleanup has happened at Hanford over the last decade. Portions of the site have already been cleaned up, removed from the National Priority List (NPL), and released for other uses (e.g., the 1100 Operable Unit). As part of the river corridor cleanup, DOE is remediating contaminated soil sites, decommissioning the plutonium production reactors and associated facilities, removing production reactor fuel from the K Basins to interim storage in the 200 Area, and treating groundwater contaminated by past operations. Offsite TRU waste would not be sent to Hanford for disposal. It will have been shipped to WIPP before closure. The WM PEIS was a comprehensive evaluation of DOE nationwide waste management, and DOE determined there was sufficient information to make decisions regarding the sites that were suitable for waste management missions. A discussion of the WM PEIS and its relationship to the HSW EIS can be found in Section 1.5. Not withstanding the above, as encouraged by various commenters, the HSW EIS includes an evaluation that assumes only Hanford wastes are managed at Hanford in the future.

Table 3.3. (contd)

CommentIDs				Subject/Response
E017/10 E044/3 F008/2 F073/3 F081/6 F082/1 F083/6 F086/2 HR006/3 HR009/5 HR015/1	L001/6 L018/1 L018/2 L054/8 L057/3 L069/1 L075/2 L084/12 L092/2 L097/41 MP001-02/1 MP001-18/1 MP001-31/1 MP001-52/1 MP003-010/2	MP003-011/4 MP003-022/2 MP003-045/4 MP003-070/3 MP003-082/1 MP003-083/1 MP003-130/1 MP003-152/1 PDA033/13 PDB001/2 PDB009/1 RL002/7 RL003/32	SEA001/32 SEA005/1 SEA006/2 SEA006/4 SEA006/5 SEA006/6 SEA009/3 SEA018/2 SEA018/5 SEA021/2 SEA021/3 SEA030/1 SEA039/8 SEA042/1 SEA044/5	Gen032: Hanford Cleanup - DOE commitment, HSW EIS Section 6.0 regulatory requirements discussion, Section 6.19 permits The U.S. Department of Energy (DOE) is committed to cleaning up the Hanford Site in accordance with the Tri-Party Agreement (TPA) and applicable environmental requirements under federal and state laws and regulations. Chapter 6 of this HSW EIS identifies potential statutory and regulatory requirements that may apply to the proposed action and alternatives, including Resource Conservation and Recovery Act (RCRA) and State Dangerous Waste Regulations under the Hazardous Waste Management Act (see Section 6.3 of the HSW EIS). Section 6.19 addresses permits required to construct and operate treatment, storage, and disposal facilities related to the alternatives.
				Gen032: Hanford Cleanup - DOE commitment, HSW EIS Section 6.0 regulatory requirements discussion, Section 6.19 permits The U.S. Department of Energy (DOE) is committed to cleaning up the Hanford Site in accordance with the Tri-Party Agreement (TPA) and applicable environmental requirements under federal and state laws and regulations. Chapter 6 of this HSW EIS identifies potential statutory and regulatory requirements that may apply to the proposed action and alternatives, including Resource Conservation and Recovery Act (RCRA) and State Dangerous Waste Regulations under the Hazardous Waste Management Act (see Section 6.3 of the HSW EIS). Section 6.19 addresses permits required to construct and operate treatment, storage, and disposal facilities related to the alternatives.

Table 3.3. (contd)

CommentIDs				Subject/Response
L092/8				Gen033: Hanford Cleanup - DOE commitment, HSW EIS Section 6.0 regulatory requirements discussion, Section 6.19 permits, transportation discussion The U.S. Department of Energy (DOE) is committed to cleaning up the Hanford Site in accordance with the Tri-Party Agreement (TPA) and applicable environmental requirements under federal and state laws and regulations. Chapter 6 of this HSW EIS identifies potential statutory and regulatory requirements that may apply to the proposed action and alternatives, including Resource Conservation and Recovery Act (RCRA) and State Dangerous Waste Regulations under the Hazardous Waste Management Act (see Section 6.3 of the HSW EIS). Section 6.19 addresses permits required to construct and operate treatment, storage, and disposal facilities related to the alternatives. About 300,000,000 hazardous material shipments take place every year in the United States. Of those shipments, about 3,000,000 involve radioactive materials and less than 10,000 involve shipment of DOE radioactive materials. Information on the potential impacts of transporting waste through Washington and Oregon has been added to Section 5.8 and Appendix H. Additional information on DOE shipping practices has been added to Section 2 of this HSW EIS.

Table 3.3. (contd)

CommentIDs				Subject/Response
ML002-28/1 ML002-29/1 ML002-30/1 MP001-01/1	MP001-07/1 MP001-13/1 MP001-14/1	SEA011/9		Gen034: Hanford Cleanup - DOE priorities, land use, long term stewardship The DOE takes very seriously its responsibility to protect and preserve the environment. Environmental restoration is DOE's top priority at Hanford and other DOE sites. Cleanup activities are being performed in accordance with the milestones and other provisions of the Hanford Federal Facility Agreement and Consent Order (also referred to as the Tri-Party Agreement or TPA). Long-term stewardship activities began at Hanford when the site was first used to support national defense beginning in 1943. Approximately 6% of the total area within the Hanford Site was occupied and actively used; with the remainder of the site managed by DOE, and its predecessor agencies, as a buffer zone. The buffer zone provided protection for the cultural, biological and natural resources located within the site's boundaries. Most of the site is undisturbed and is as environmentally pristine as it was before the Hanford national defense mission was undertaken during World War II. The long-term stewardship vision for Hanford's future is that the vitality of human, biological, natural and cultural resources be sustained over multiple generations. The revised draft HSW EIS evaluates various forecast waste quantities that include only Hanford-generated waste, in addition to varying amounts of offsite waste. This evaluation reflects the uncertainty in waste quantities that Hanford might receive from offsite. The inclusion of a Hanford-only waste volume provides the basis for determining the incremental impacts of offsite waste. See Section 3.2 for a discussion of the different waste volumes addressed in the HSW EIS. The evaluations of groundwater impacts in Section 5.15 of the draft HSW EIS include the impacts of the wastes to be managed within the scope of the HSW EIS NEPA review, as well as the CERCLA wastes disposed in the Hanford ERDF. Analysis indicates that these wastes could be handled without complicating future remediations, or diverting resources or disposal capacity from other Hanford cleanup activities.

Table 3.3. (contd)

CommentIDs				Subject/Response
L040/1	SEA013/18	SEA013/19		Gen035: Hanford Cleanup - Environmental monitoring program In 2001 alone, samples were collected from 735 groundwater monitoring wells to determine the distribution and movement of existing radiological and chemical constituents in Hanford Site groundwater and identify and characterize potential and emerging groundwater contamination problems. Samples were analyzed for about 40 different radionuclide constituents and about 290 different chemical constituents. Airborne radionuclide samples were collected at 45 continuously operating samplers: 24 on the Hanford Site, 11 near the site perimeter, 8 in nearby communities, and 2 in distant communities. Nine stations were community-operated environmental surveillance stations managed and operated by local school teachers as part of an ongoing DOE-sponsored program to promote public awareness of Hanford Site environmental monitoring programs.
ML002-15/3 MP001-20/1 MP001-32/1 MP001-34/1 MP001-46/1 MP001-54/1 MP001-60/1 MP002-14/1	MP002-23/1 MP002-27/1 MP003-005/4 MP003-013/2 MP003-014/2 MP003-016/1 MP003-061/3 MP003-069/2	MP003-090/4 MP003-108/4 MP003-112/1 MP003-117/3 MP003-119/2 MP003-128/3 MP003-148/3	SEA010/14 SEA032/1 SEA042/10 SEA043/3 SEA048/3	Gen036: Hanford Cleanup - Hanford Cleanup - DOE commitment and progress, cultural resource protection, stewardship The U.S. Department of Energy (DOE) is committed to cleanup of the Hanford Site through the Tri-Party Agreement (TPA) process. A lot in the way of cleanup has happened at Hanford over the last decade. Portions of the site have already been cleaned up, removed from the National Priority List (NPL), and released for other uses (e.g., the 1100 Operable Unit). As part of the river corridor cleanup, DOE is remediating contaminated soil sites, decommissioning the plutonium production reactors and associated facilities, removing production reactor fuel from the K Basins to interim storage in the 200 Area, and treating groundwater contaminated by past operations. Over the years, DOE, and its predecessor agencies, have developed and implemented various activities to protect these unique resources, which now fall under the umbrella of long-term stewardship. The DOE presence and restricted access to the site has preserved a number of critical habitats and protected a number of threatened ecological resources that probably would not exist today without the 60-year federal control of the site. The preservation of the critical habitats has provided a vital link in the preservation of the bio-diversity of the Columbia Basin's eco-region. The long-term stewardship vision for Hanford's future is that the vitality of human, biological, natural and cultural resources be sustained over multiple generations.

Table 3.3. (contd)

CommentIDs				Subject/Response
F073/2 L072/1 L093/1 L093/4	MP001-43/1 MP003-003/1 MP003-004/2 MP003-008/2 MP003-026/1 MP003-152/2	PDA011/2 PDA020/1 PDA024/4	SEA047/9	Gen037: Hanford Cleanup - Scope of cleanup activities The scope of the cleanup activity is expected to include maintenance of the leachate collection system, monitoring of the cap performance, and maintenance of passive administrative controls (signs/postings). Groundwater monitoring is conducted according to DOE Orders, the Resource Conservation and Recovery Act (RCRA) permit, and Tri-Party Agreement (TPA) requirements for the disposal areas, and will be expanded as necessary according to agreements between DOE and regulatory agencies to support future waste management operations. DOE is committed to meeting environmental regulations and standards now and in the future. The U.S. Environmental Protection Agency (EPA) and Washington State Department of Ecology (under the Comprehensive Environmental Response, Compensation and Liability Act [CERCLA] and RCRA) require monitoring, reporting, and recordkeeping. Thus, there is a legal requirement that DOE, or its successor entities, meet these requirements.
L054/3	PDA021/2			Gen038: Hanford Cleanup - Wastes can be managed without complicating future remediations, diverting resources, disposal capacity Analysis indicates that these wastes could be handled without complicating future remediations, or diverting resources or disposal capacity from other Hanford cleanup activities.
MP003-142/2				Gen039: Hanford Cleanup - Wastes can be managed without complicating future remediations, diverting resources, disposal capacity, transportation Analysis indicates that these wastes could be handled without complicating future remediations, or diverting resources or disposal capacity from other Hanford cleanup activities. Additional discussion of transportation has been added in Section 2.2.4, Section 5.8, and Appendix H in Volumes I and II of this HSW EIS. A discussion of transporting waste to and from Hanford through the states of Oregon and Washington is included.
F079/4	F081/8	ML002-14/1		Gen040: Health Impact Evaluation - Additional analysis and information Additional analysis of human health and environmental impacts has been done. Section 5 and related appendixes have been revised to present this additional information.

Table 3.3. (contd)

CommentIDs				Subject/Response
E017/2 L011/2 L011/9	L042/3 L097/43 L102/8 L102/9	L106/11 L106/16 ML002-27/1	SEA013/7 SEA028/7	Gen041: Health Impact Evaluation - Groundwater impacts, uncertainties, mitigation measures, monitoring, alternatives for LLW disposal in lined trenches This Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement (HSW EIS) evaluates health impacts on downstream populations of groundwater reaching the Columbia River over a 10,000-year time frame. The impacts of groundwater reaching the river are discussed in Section 5.3 and Appendix G. See also Sections 5.11 and Appendixes F and G. Additional discussion of uncertainties associated with these analyses has been included in Section 3.5. Refer to Section 5.18 for additional discussion of potential mitigation measures. Groundwater monitoring is conducted according to DOE Orders, the Resource Conservation and Recovery Act (RCRA) permit, and Tri-Party Agreement (TPA) requirements for the disposal areas. Groundwater monitoring will be expanded as necessary according to agreements between DOE and regulatory agencies to support future waste management operations. DOE has added alternatives for evaluation in this HSW EIS that include disposal of LLW in lined trenches with regulatory-compliant leachate collection systems (see Section 3.1).
E004/6 F015/4	L091/41 L106/17 L106/28	PDA003/3	SEA023/9 SEA028/6	Gen042: Health Impact Evaluation - Time frame, impacts on Columbia River, uncertainties, mitigation measures This Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement (HSW EIS) evaluates health impacts on downstream populations of groundwater reaching the Columbia River over a 10,000-year time frame. The impacts of groundwater reaching the river are discussed in Section 5.3 and Appendix G. See also Sections 5.11 and Appendixes F and G. Additional discussion of uncertainties associated with these analyses has been included in Section 3.5. Refer to Section 5.18 for additional discussion of potential mitigation measures.

Table 3.3. (contd)

CommentIDs				Subject/Response
E012/2	RL004/3	SEA010/10		Gen043: Health Impact Evaluation - Time frame, impacts on Columbia River, uncertainties, mitigation measures, LLW disposal in lined trenches This Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement (HSW EIS) evaluates health impacts on downstream populations of groundwater reaching the Columbia River over a 10,000-year time frame. The impacts of groundwater reaching the river are discussed in Section 5.3 and Appendix G. See also Sections 5.11 and Appendixes F and G. Additional discussion of uncertainties associated with these analyses has been included in Section 3.5. Refer to Section 5.18 for additional discussion of potential mitigation measures. DOE has added alternatives for evaluation in the HSW EIS that include disposal of LLW in lined trenches with regulatory-compliant leachate collection systems (see Section 3.1).
E004/10 E023/3 E035/2 F015/5 L010/2 L033/4 L061/2 L063/11	L064/11 L067/6 L073/7 L080/23 L102/3 L102/4 L102/21 L106/1 L106/36 L106/41	LG001/1 MP003-021/3 P007/2 PDA022/11 PDA028/3 RL001/16	SEA001/17 SEA008/2 SEA011/6 SEA013/11 SEA013/13 SEA013/15 SEA013/20	Gen044: Information Content - Additional information on alternatives, environmental impacts, cumulative impacts, and other subjects Further information on alternatives, environmental impacts, cumulative impacts, and other subjects has been added.
E014/3 F065/6	L080/273 L080/314 L080/316	L080/318 L080/319 L080/322	L080/323 L080/324	Gen045: Information Content - Geologic information references, not a basis for EIS revisions Details regarding the geology of this area are documented in the Hanford Site Environmental Report 2001 (Poston et al. 2002) and the Hanford Site National Environmental Policy Act (NEPA) Characterization document (Neitzel 2002). These details do not change the assessment documented in the HSW EIS.
L080/246 L080/330 L080/424	L080/427 L080/469 L080/470	L080/472 L080/476	L080/477 L080/482	Gen046: Information Content - Historical document availability, not a basis for EIS revisions Historical documents are publicly available at the DOE Reading Room or Public Library in Richland, Washington and additional information is available on the Internet. These details do not change the assessment documented in this HSW EIS.

Table 3.3. (contd)

CommentIDs				Subject/Response
F013/1 L018/5 L074/4 L091/2 LG022/1	MP003-042/1 MP003-047/2 MP003-091/1 MP003-099/1	PDA016/1		Gen047: Information Content - Information included to assist in DOE decisions, revised purpose and need in response to regulatory agency and public comments This HSW EIS provides important environmental information to assist DOE in making decisions about site-specific storage, treatment, and disposal actions at Hanford. This EIS includes a revised purpose and need statement that was developed in consultation with the U.S. Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology) staff, as well as in consideration of comments received from the public (see HSW EIS Section 1.2).
E017/11 F016/14	L063/2 L085/4 L104/25 L104/36	SEA008/1 SEA041/4		Gen048: Information Content - NEPA analysis approach The DEIS uses available data, computer modeling, assumptions, and related analytical methods to produce estimates of reasonably foreseeable environmental impacts. The analytical approach was consistently applied to each alternative, and it provided information that allowed objective parametric comparison of the alternatives. Additional information has been provided in the revised HSW EIS.
L080/10 L080/237 L080/238 L080/247 L080/252 L080/254 L080/259 L080/263 L080/265 L080/272 L080/274 L080/275 L080/278 L080/282 L080/283 L080/284 L080/286 L080/296 L080/297 L080/298 L080/299 L080/301 L080/304 L080/306 L080/307	L080/348 L080/349 L080/350 L080/351 L080/352 L080/355 L080/357 L080/358 L080/360 L080/361 L080/362 L080/363 L080/364 L080/365 L080/366 L080/367 L080/369 L080/370 L080/371 L080/372 L080/374 L080/375 L080/377 L080/378 L080/379	L080/413 L080/414 L080/415 L080/417 L080/419 L080/420 L080/422 L080/429 L080/430 L080/431 L080/433 L080/434 L080/435 L080/436 L080/438 L080/439 L080/440 L080/441 L080/442 L080/443 L080/444 L080/445 L080/446 L080/447 L080/448	L080/483 L080/485 L080/486 L080/487 L080/488 L080/489 L080/490 L080/491 L080/492 L080/493 L080/494 L080/500 L080/502 L080/506 L080/507 L080/508 L080/509 L080/510 L080/511 L080/512 L080/513 L080/514 L080/515 L080/517 L080/519	Gen049: Information Content - Purpose and relationship of Sections 3, 4, and 5, changes not incorporated The purpose of Section 4 is to provide a description of the environment that might be affected by the alternatives described in Section 3. The results of analyses performed to assess potential environmental consequences of implementing the alternatives are presented in Section 5. These comments do not change the assessment documented in this HSW EIS.

Table 3.3. (contd)

CommentIDs				Subject/Response
L080/309 L080/310 L080/312 L080/313 L080/317 L080/320 L080/321 L080/325 L080/327 L080/328 L080/329 L080/332 L080/333 L080/334 L080/335 L080/336 L080/338 L080/339 L080/340 L080/341 L080/342 L080/343 L080/344	L080/383 L080/384 L080/385 L080/386 L080/388 L080/389 L080/390 L080/391 L080/392 L080/393 L080/394 L080/395 L080/397 L080/398 L080/399 L080/401 L080/402 L080/403 L080/404 L080/406 L080/407 L080/408 L080/411	L080/449 L080/450 L080/451 L080/453 L080/454 L080/455 L080/456 L080/457 L080/459 L080/460 L080/461 L080/462 L080/463 L080/464 L080/465 L080/467 L080/468 L080/471 L080/473 L080/474 L080/479 L080/480 L080/481	L080/520 L080/521 L080/522 L080/523 L080/524 L080/525 L080/526 L080/527 L080/528 L080/529 L080/530 L080/531 L080/532 L080/533 L080/534 L080/535 L080/536 L080/541 L080/542 L080/543 L080/544 L106/26	
L080/6 L080/12 L080/241 L080/243 L080/248 L080/258 L080/260 L080/261 L080/288 L080/291	L080/311 L080/315 L080/326 L080/337 L080/345 L080/347 L080/354 L080/373 L080/380 L080/381	L080/382 L080/400 L080/409 L080/410 L080/412 L080/416 L080/425 L080/426 L080/458 L080/478	L080/495 L080/496 L080/497 L080/498 L080/499 L080/537 L080/538 L080/539 L080/540	Gen050: Information Content - Purpose and relationship of Sections 3, 4, and 5, some changes incorporated The purpose of Section 4 is to provide a description of the environment that might be affected by the alternatives described in Section 3. The results of analyses performed to assess potential environmental consequences of implementing the alternatives are presented in Section 5. These comments do not change the assessment documented in this HSW EIS. In some cases, however, the comments have been incorporated.
SEA004/1	SEA038/2			Gen051: Information Content - Regulatory This comment is not addressed to DOE. However, in Section 6 of this HSW EIS, we identify the regulatory requirements followed in conducting operations at Hanford Site, including RCRA and State Dangerous Waste Regulations under the Hazardous Waste Management Act (Section 6.3). Section 6.19 addresses permits required to construct and operate treatment, storage, and disposal facilities related to the alternatives.
HR022/3	L091/37 L093/9 LG012/3	PDB018/1 RL007/1 RL007/3	SEA043/4	Gen052: Native American Concerns - Potential adverse impacts DOE is cognizant of the concerns of Native Americans and others that operations at Hanford, including those discussed in this HSW EIS, could adversely impact

Table 3.3. (contd)

CommentIDs				Subject/Response
				Native Americans and their lifestyle. This HSW EIS includes discussion of potential impacts to cultural resources (Section 5.7), aesthetic and scenic resources (Section 5.12), and environmental justice (Section 5.13).
E032/1 F016/12 F047/1 F061/5	 L011/5 L057/6 L080/155	L091/7 L097/3 L106/7 LG007/5	 P007/1 RL003/26	Gen053: No Action Alterative - Evaluation of Impacts waste coming from offsite (the Hanford Only waste volume) have been evaluated. A discussion of these impacts has been added to this HSW EIS.
F005/5	L091/12 L097/35 L097/37 L097/46 L097/57 L106/48	SEA010/12 SEA010/13 SEA023/10		Gen054: Point of Assessment Approach - Basis for NEPA evaluation, intruder scenario evaluation, groundwater monitoring The maximum point of impact from multiple and widely dispersed sources is not necessarily directly underneath the Low Level Burial Grounds or at the Low Level Burial Ground boundary. To model the groundwater impacts from multiple and widely dispersed disposal units over long periods of time, a 1-km "point of analysis" location was deemed to be more appropriate and representative than a regulatory "point of compliance" well location. The point of analysis approach is considered more technically appropriate for a NEPA evaluation of groundwater impacts. More specific clarification about the differences between the point of analysis used in the HSW EIS groundwater impact analysis and the RCRA point of compliance for land disposal unit groundwater monitoring wells is provided in Section 5.3 and Appendix G.The potential impacts of drilling or digging into waste sites are included in this HSW EIS. These "intruder" scenarios can be found in Section 5.11 and Appendix F. Groundwater monitoring is conducted according to DOE Orders, the Resource Conservation and Recovery Act (RCRA) permit, and Tri-Party Agreement requirements for the disposal areas. Groundwater monitoring will be expanded as necessary according to agreements between DOE and regulatory agencies to support future waste management operations.
L098/3 L098/5	PDA017/12 PDA018/1 PDA030/4	SEA032/3		Gen055: Public Involvement - Access to additional information The DOE Environmental Management program websites with information relevant to the HSW EIS process are located at http://www.em.doe.gov/webindex.html and http://www.hanford.gov/netlib/eis.asp. Access to some of the information on the website has been restricted due to national security concerns. Information can also

Table 3.3. (contd)

CommentIDs				Subject/Response
				be requested from the NEPA Document Manager, or may be reviewed at the DOE Hanford Reading Room in Richland, WA.
E004/5 F005/7 L057/13	L100/5 L102/7 PDA032/5 PDB018/2	SEA011/7 SEA023/7 SEA026/1 SEA027/1	SEA028/3 SEA032/6 SEA044/4	Gen056: Public Involvement - Consultations during EIS process DOE consults extensively with regulatory agencies, Native American Tribal governments, organizations, and members of the public during its NEPA review processes.
F064/1	LG003/7	PDB021/1		Gen057: Public Involvement - DOE legal obligations under applicable laws and regulations DOE takes its legal obligations very seriously and works toward fulfilling the letter and intent of applicable laws and regulations.
L077/1 L097/26	MP003-039/2	RL002/6	SEA049/2	Gen058: Public Involvement - Issues or concerns addressed in revised draft HSW EIS During preparation of the draft HSW EIS, the U.S. Department of Energy (DOE) has been cognizant of issues raised during public review of related National Environmental Policy Act (NEPA) documents and other Hanford initiatives that address waste management issues. To the extent that those issues or concerns were related to the HSW EIS, they are addressed in this HSW EIS.
F001/2 F016/11 F046/2 F075/3 HR022/4 L097/33 LG019/1	ME001-01/1 ML002-26/2 MP002-12/1 MP003-031/2 MP003-041/2 MP003-045/3 MP003-065/5 MP003-079/1	PDA003/7 PDA022/6 PDA032/4 PDB011/4 PDB013/4 RL003/18	SEA001/16 SEA040/1 SEA043/1 SEA047/3	Gen059: Public Involvement - Issues or concerns considered in developing revised draft HSW EIS During preparation of the draft HSW EIS, the U.S. Department of Energy (DOE) has been cognizant of issues raised during public review of National Environmental Policy Act (NEPA) documents and other Hanford initiatives addressing waste management issues. To the extent that the issues or concerns raised during these public reviews are related to this HSW EIS, they have been considered by DOE in developing the revised analyses and discussions included in this current draft HSW EIS.
F016/6 L097/19 L098/17	LG003/11 PDA022/3 PDA029/1	PDA031/10 PDA034/5 PDA035/1		Gen060: Public Involvement - Notices of public meetings DOE issues press releases in advance of public meetings. Other public announcement efforts include briefings to concerned parties, advance mailing of information, and newspaper advertisements.
 F084/1 L010/1 L015/1	L091/3 L097/20 L106/4 L106/60	PDA022/8 PDA027/1 PDA032/1 PDA032/3 PDA034/1		Gen061: Public Involvement - Response to public comments All public comments received during the HSW EIS process are recorded, reviewed, and responded to in

Table 3.3. (contd)

CommentIDs				Subject/Response
		PDB014/1		accordance with applicable NEPA regulations and DOE policies.
L080/11 L080/48 L080/58	L080/60 L080/217 L080/281	L080/428 L080/437	SEA041/10	Gen062: Reference Availability Some of the references used in preparing the first draft HSW EIS have been withdrawn from the Internet because of national security concerns. Supporting documentation is available at the Hanford Reading Room in Richland, WA. Key references may also be available on compact disk (CD) or may be requested from the NEPA Document Manager.
E017/8 F011/5 F016/17 F081/1 HR009/4 HR022/2	L092/12 L097/14 L097/40 L106/49 L106/50	MP002-04/2 MP002-20/1 MP003-028/3 RL001/15 RL003/2	SEA001/33 SEA013/5 SEA013/8 SEA013/9	Gen063: Regulatory Compliance and Oversight - Waste management at Hanford Waste management practices at Hanford are regulated by the U. S. Environmental Protection Agency and the Washington State Department of Ecology. In addition, Congress has oversight responsibilities over these waste management activities.
E017/4 E037/1 E041/1 E046/2 E046/4 E051/2 F046/4 F055/3 F055/5 F074/2 HR004/2	L009/3 L026/7 L029/2 L031/3 L033/5 L051/3 L058/2 L063/7 L064/7 L066/2 L071/2 L073/3 L093/6 L100/3	LG004/6 MP003-002/4 MP003-045/2 MP003-066/3 MP003-076/2 MP003-077/3 MP003-096/2 MP003-131/3 MP003-149/2 MP003-153/1	 PDB012/6 PDB017/4 SEA036/3	Gen064: Revisions - ILAW and other bases for revisions EIS to accommodate disposal of ILAW, in addition to new waste management alternatives under consideration since the first draft was issued in April 2002. This HSW EIS analyzes additional alternatives that include mitigation measures such as liners, leachate collection systems, a lined mega-trench, ranges of waste volumes, and capping. This EIS includes additional alternatives for disposal of LLW, MLLW, immobilized low-activity waste (ILAW), and Waste Treatment Plant (WTP) melters in either independent or combined-use facilities that would comply with RCRA and state standards for disposal of hazardous wastes. A number of locations for the facilities are considered, including the ERDF. This EIS also evaluates various forecast waste quantities that include only Hanford generated waste, in addition to various amounts of offsite waste. This evaluation reflects the uncertainty in waste quantities that Hanford might receive under the WM PEIS decisions for MLLW, LLW, and TRU waste. The inclusion of a Hanford Only waste volume provides the basis for determining the incremental impacts of offsite waste and the impacts that would be avoided at Hanford Site if these offsite wastes were disposed of elsewhere. DOE shares your concerns for protecting the Columbia River. Analysis of alternatives assess the impacts on water quality in the Columbia River. For all waste alternatives analyzed in this HSW EIS, DOE has analyzed the movement of contaminants through groundwater to the Columbia River. In all cases, it

Table 3.3. (contd)

CommentIDs				Subject/Response
				found that the water quality of the Columbia River would be indistinguishable from the current river background levels. The concentrations of all constituent contaminants were well below benchmark maximum contaminant levels at a hypothetical well located near the Columbia River. The health impacts on downstream populations of groundwater reaching the Columbia River are discussed in Section 5.11 and Appendix F. The ecological impacts are discussed in Section 5.5 and Appendix I. The impacts of groundwater reaching the river are discussed in Section 5.3 and Appendix G. Additional discussion of uncertainties has been added to Section 3.X. Additional discussion of mitigation measures appears in Section 5.18. According to the Columbia River Basin Fish Contaminant Survey (U.S. Environmental Protection Agency. 1996-1998. Columbia River Basin Fish Contaminant Survey. EPA 910-R-02-006. Region 10, Seattle, Washington), contaminants contributing to the potential risks for Native Americans were PCBs (Aroclors and dioxin-like PCBs), chlorinated dioxins and furans, a limited number of pesticides (DDT and others), mercury and arsenic. These chemicals occur in the Columbia River as a result of agricultural and industrial operations (pulp and paper plants, for example) and are very unlikely to be of Hanford origin. These chemicals would not exist in wastes proposed for future disposal at Hanford, or, if present, would be treated to reduce their mobility and toxicity if present.

Table 3.3. (contd)

CommentIDs				Subject/Response
L047/1 L050/1	L061/1 L104/2		SEA003/1	Gen065: Revisions - ILAW and other bases for revisions DOE has elected to prepare a second draft of the HSW EIS to accommodate disposal of ILAW, in addition to new waste management alternatives under consideration since the first draft was issued in April 2002. This HSW EIS analyzes additional alternatives that include mitigation measures such as liners, leachate collection systems, a lined mega-trench, ranges of waste volumes, and capping. This EIS includes additional alternatives for disposal of LLW, MLLW, immobilized low-activity waste (ILAW), and Waste Treatment Plant (WTP) melters in either independent or combined-use facilities that would comply with RCRA and state standards for disposal of hazardous wastes. A number of locations for the facilities are considered, including the ERDF. This EIS also evaluates various forecast waste quantities that include only Hanford generated waste, in addition to various amounts of offsite waste. This evaluation reflects the uncertainty in waste quantities that Hanford might receive under the WM PEIS decisions for MLLW, LLW, and TRU waste. The inclusion of a Hanford Only waste volume provides the basis for determining the incremental impacts of offsite waste and the impacts that would be avoided at Hanford Site if these offsite wastes were disposed of elsewhere. The approach taken in the HSW EIS is consistent with the methods, characteristics, and controls associated with a composite analysis as described by the Columbia River Comprehensive Impact Assessment (CRCIA) team. The analysis modules included in the SAC parallel those identified by CRCIA and were developed through work group meetings that included regulator and stakeholder participation. Several key modules were adopted directly from the CRCIA including the module used to calculate human health impacts (the HUMAN code) and the module used to calculate impacts to ecological species (the ECEM code).

Table 3.3. (contd)

CommentIDs				Subject/Response
	L021/2	L098/19	MP003-056/2	Gen066: Revisions - ILAW, other bases DOE has elected to prepare a second draft of the HSW EIS to accommodate disposal of ILAW, in addition to new waste management alternatives under consideration since the first draft was issued in April 2002. This HSW EIS analyzes additional alternatives that include mitigation measures such as liners, leachate collection systems, a lined mega-trench, ranges of waste volumes, and capping. This EIS includes additional alternatives for disposal of LLW, MLLW, immobilized low-activity waste (ILAW), and Waste Treatment Plant (WTP) melters in either independent or combined-use facilities that would comply with RCRA and state standards for disposal of hazardous wastes. A number of locations for the facilities are considered, including the ERDF. This EIS also evaluates various forecast waste quantities that include only Hanford generated waste, in addition to various amounts of offsite waste. This evaluation reflects the uncertainty in waste quantities that Hanford might receive under the WM PEIS decisions for MLLW, LLW, and TRU waste. The inclusion of a Hanford Only waste volume provides the basis for determining the incremental impacts of offsite waste and the impacts that would be avoided at Hanford Site if these offsite wastes were disposed of elsewhere.
E015/1	L023/2	L100/1	MP003-061/1	
E015/2	L023/11	L100/4		
E018/3	L024/1	L102/1	MP003-070/2	
E023/5		L102/22	MP003-075/2	
E026/1	L026/11	L102/27	MP003-078/1	
E035/1	L028/1	L104/3		
	L031/4	L104/4	MP003-109/1	
E038/4	L033/2	L104/5	MP003-114/1	
E041/4	L033/3	L104/13	MP003-139/1	
E043/2	L034/1	L104/27		
E043/3	L037/2	L104/38	MP003-145/1	
		L104/42	MP003-146/3	
F004/1	L040/3	L104/53		
F004/2	L045/2	L104/55		
F015/7	L045/11	L106/5		
F020/1		L106/13	PDA003/6	
F027/6	L056/1	L106/56	PDA007/2	
F027/7	L057/14	L106/57		
F028/1	L061/4	L106/61	PDA010/1	
F029/5		LG006/7	PDA022/2	
F037/1	L064/2		PDA024/1	
F042/4	L067/2	LG009/2		
F061/2	L071/1	LG012/6	PDA033/9	
F067/3		LG012/7	PDB011/3	
F074/5	L073/1			
F076/1	L074/3	LG030/1		
F078/2	L076/1		RL001/12	
F080/1		ME001/2	RL001/20	
F081/5	L080/50		RL003/6	
F083/3	L080/165		RL003/28	
	L080/220	ML002-02/1	RL008/7	
HR005/2		ML002-07/2	RL008/8	
HR008/1	L085/1	ML002-12/1		
HR010/3	L085/2	ML002-17/3	SEA001/22	
HR015/3	L091/5	ML002-21/1	SEA015/1	
HR017/2		ML003/1	SEA028/2	
HR018/1	L097/2		SEA028/12	
HR022/1	L097/6	MP001-12/1		
	L097/13	MP001-28/1	SEA030/2	
L001/1		MP001-41/1	SEA035/5	
L003/1	L097/18	MP001-48/1	SEA041/5	
L009/1	L097/65	MP002-08/1		
	L098/1	MP003-006/2	SEA049/4	
L012/12	L098/4	MP003-020/2		
L020/2	L098/11	MP003-039/1		
L020/11	L098/18	MP003-043/1		

Table 3.3. (contd)

CommentIDs				Subject/Response
L084/7				Gen067: Revisions - ILAW, other bases, pre-1970 waste DOE has elected to prepare a second draft of the HSW EIS to accommodate disposal of ILAW, in addition to new waste management alternatives under consideration since the first draft was issued in April 2002. This HSW EIS analyzes additional alternatives that include mitigation measures such as liners, leachate collection systems, a lined mega-trench, ranges of waste volumes, and capping. This EIS includes additional alternatives for disposal of LLW, MLLW, immobilized low-activity waste (ILAW), and Waste Treatment Plant (WTP) melters in either independent or combined-use facilities that would comply with RCRA and state standards for disposal of hazardous wastes. A number of locations for the facilities are considered, including the ERDF. This EIS also evaluates various forecast waste quantities that include only Hanford generated waste, in addition to various amounts of offsite waste. This evaluation reflects the uncertainty in waste quantities that Hanford might receive under the WM PEIS decisions for MLLW, LLW, and TRU waste. The inclusion of a Hanford Only waste volume provides the basis for determining the incremental impacts of offsite waste and the impacts that would be avoided at Hanford Site if these offsite wastes were disposed of elsewhere. In general, waste disposed of prior to 1970 will be addressed through Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) response activities or other NEPA documentation, as appropriate. Cumulative impacts of waste remaining onsite, including waste disposed of prior to 1970, are addressed in Section 5.14 and Appendix L of the HSW EIS. Uncertainties regarding the inventory of wastes are discussed in Section 3.5.

Table 3.3. (contd)

CommentIDs				Subject/Response
E018/1 E032/2 E038/2 F010/4 F010/5 F018/7 F018/8 F018/9 F028/2 F030/1 F030/2 F041/5 F050/1 F051/1 HR004/1 HR006/1 L012/11 L013/1 L019/1 L020/10 L026/10 L045/10	L049/6 L049/7 L063/3 L063/10 L064/10 L078/5 L080/68 L080/154 L084/9 L091/1 L091/15 L091/26 L092/6 L097/11 L100/2 L102/12 L104/17 L104/39 L106/25 L106/52 LG002/1 ML002/2 ML002-11/1	MP001-56/1 MP002-08/2 MP002-22/1 MP003-009/3 MP003-011/1 MP003-014/3 MP003-026/3 MP003-028/2 MP003-133/2 P003/1 P003/3 PDA005/8 PDA008/2 PDA028/5 PDB003/2 PDB004/1 PDB005/1 PDB011/2 PDB014/2 PDB026/2	 RL008/2 RL008/5 SEA003/2 SEA010/6 SEA011/4 SEA013/2 SEA013/12 SEA016/1 SEA016/2 SEA023/1 SEA024/2 SEA028/4 SEA028/15 SEA028/16 SEA032/2 SEA042/5 SEA042/6 SEA047/1	Gen068: Revisions - In response to comments, new waste management activities and alternatives response to comments on the first draft HSW EIS, and to incorporate new waste management activities and alternatives that have been under consideration since the first draft was issued. Revisions include the following: • a more comprehensive discussion of Hanford waste management activities as they relate to cleanup at Hanford and other DOE sites (see Summary and Section 1) • expanded analyses for groundwater quality (Section 5.3, Appendix G), transportation (Section 5.8, Appendix H), cumulative impacts (Section 5.14), and other consequences identified as being of particular concern in public comments • evaluation of impacts from managing Hanford-generated waste separately from offsite waste to facilitate understanding the incremental consequences from offsite waste that may be received for treatment or disposal at Hanford ILAW, and WTP melters in either independent or combined-use facilities • evaluation of some new waste management activities proposed as a result of the C3T process and plans to accelerate Hanford cleanup, such as the Hanford Performance Management Plan issued in August 2002, to the extent possible. In some cases, those proposals would need to be evaluated during future NEPA reviews because they are not ripe for decision at this time.
E020/2 E036/1 E042/2 E045/3	F016/18 F018/6 F029/6 L062/1 L074/2	MP003-005/3 MP003-103/2 RL003/29	SEA010/19 SEA010/22 SEA010/23 SEA035/1	Gen069: Revisions - LLW in lined trenches discussions and alternatives including the disposal of LLW in lined trenches with leachate collection systems.

Table 3.3. (contd)

CommentIDs				Subject/Response
F073/6	L080/85	L080/137		Gen070: Revisions - Section 4.0 and other editorial comment revisions Thank you for your comments. The results of analyses performed to assess the potential environmental consequences of implementing the alternatives are not affected by these comments.
	L080/86	L080/138	L080/197	
L002/1	L080/88	L080/140	L080/198	
	L080/89	L080/141	L080/199	
L080/8	L080/93	L080/142		
L080/9	L080/94	L080/143	L080/201	
L080/15	L080/95	L080/144	L080/202	
L080/16	L080/96	L080/145	L080/203	
	L080/97			
L080/18	L080/99	L080/147	L080/205	
L080/20	L080/100	L080/148	L080/206	
L080/21	L080/101	L080/149	L080/207	
L080/22	L080/102	L080/150		
L080/27	L080/103	L080/151	L080/210	
L080/28	L080/104	L080/153	L080/212	
L080/30	L080/105	L080/156	L080/213	
	L080/106	L080/158	L080/214	
L080/38	L080/107	L080/159	L080/215	
L080/41	L080/108	L080/161	L080/216	
L080/42	L080/109	L080/162		
L080/49	L080/110	L080/163	L080/219	
L080/52	L080/111	L080/164	L080/222	
L080/55	L080/112	L080/166	L080/229	
L080/59	L080/113	L080/167		
L080/61	L080/114	L080/168	L080/244	
L080/62	L080/115	L080/169	L080/256	
L080/63	L080/116	L080/170	L080/346	
L080/65	L080/117	L080/171	L080/505	
L080/66	L080/118	L080/172	L091/13	
L080/67	L080/119	L080/174	L102/26	
L080/69	L080/120		L104/8	
L080/70	L080/121	L080/176	L104/9	
L080/71	L080/122		L104/20	
L080/72	L080/123	L080/180	L106/22	
L080/73	L080/124	L080/181	L106/29	
L080/74	L080/125	L080/183	L106/30	
	L080/126			
L080/76	L080/127	L080/186	LG005/4	
L080/77	L080/128	L080/187		
	L080/129	L080/188	PDB018/4	
L080/79	L080/130			
	L080/131	L080/190	RL003/19	
L080/81		L080/191	RL003/31	
L080/82	L080/134	L080/192		
	L080/135	L080/193	SEA014/1	
L080/84	L080/136	L080/194		

Table 3.3. (contd)

CommentIDs				Subject/Response
E018/2 F032/1 F049/3 L041/2 L080/24 L102/25 L104/11	L106/2 L106/58 LG013/2 LG020/2 ML002-06/1 MP003-094/1 MP003-095/1 MP003-108/3	PDA010/2 PDA010/5 PDA017/9 PDA020/5 PDA024/2 PDA025/2 PDA027/6 PDA029/6 PDA031/8	RL001/13 SEA001/27	Gen071: Scope - Consistency with WM PEIS, WIPP SEIS, other environmental documentation, additional information The scope of this HSW EIS is consistent with decisions made as part of the Waste Management Programmatic Environmental Impact Statement, the Waste Isolation Pilot Plant Supplemental Environmental Impact Statement, and other environmental documentation. Further information on alternatives, environmental impacts, cumulative impacts, and other subjects has been added, in part, to respond to comments.
F023/5 F049/1 HR013/1	L005/2 L043/1 L057/7 L068/1 L092/3	LG006/4 MP002-27/2 PDB012/5	SEA001/5 SEA013/1 SEA025/6 SEA039/4	Gen072: Scope - Hanford Tanks not included in scope Management of the Hanford Single-Shell Tank System and Double-Shell Tank System is beyond the content and purpose of the HSW EIS, but will be addressed in the Hanford Tank Closure EIS which is in preparation. Additional NEPA documentation for Hanford may be found at: http://www.hanford.gov/netlib/eis.asp. Cumulative impacts, including impacts from other Hanford site activities such as tank farm operations, are addressed in Section 5.14 and Appendix G.
L014/3				Gen073: Scope - Hanford Tanks not included in scope, transportation discussion Management of the Hanford Single-Shell Tank System and Double-Shell Tank System is beyond the content and purpose of the HSW EIS, but will be addressed in the Hanford Tank Closure EIS which is in preparation. Additional NEPA documentation for Hanford may be found at: http://www.hanford.gov/netlib/eis.asp. Cumulative impacts, including impacts from other Hanford site activities such as tank farm operations, are addressed in Section 5.14 and Appendix G. Additional discussion of transportation has been added in Section 2.2.4, Section 5.8, and Appendix H in Volumes I and II of this HSW EIS. A discussion of transporting waste to and from Hanford through the states of Oregon and Washington is included.
L057/4 L057/5 L092/4	LG029/1 MP001-55/1 MP003-072/2	PDA013/1	SEA039/2 SEA039/3 SEA039/5	Gen074: Scope - HLW exclusion, ILAW inclusion This HSW EIS proposes no changes to existing decisions made regarding the management of high-level waste. Alternatives for the disposal of immobilized low-activity waste have been added to this HSW EIS. Potential environmental impacts of these alternatives are presented in Section 5 and related appendixes.

Table 3.3. (contd)

CommentIDs				Subject/Response
E036/4 F057/5 F065/1	HR002/5 HR002/6 L001/5 L102/15 LG020/1	ML002-18/1 PDA031/7 PDA032/2 PDB025/3		Gen075: Terrorist Attacks - Expected consequences discussed in HSW EIS While the probability of malicious events (including sabotage and terrorist attacks) cannot be determined, it is expected that the consequences of such events would be similar to accidents involving fires and explosions, which are discussed in this HSW EIS (see Sections 5.8 and 5.11 and associated Appendixes H and F).
E006/4 E011/2 E017/7 E023/4 E034/4 F006/2 F060/3 F063/1 F068/1 HR002/7 HR008/3 L004/3 L011/10	L080/13 L080/230 L084/8 L087/2 L087/3 L091/45 L097/23 L102/16 LG003/6 LG003/12 LG004/5 LG006/10 LG007/2 LG008/1 LG012/1	LG013/1 LG014/1 LG015/1 LG016/1 LG017/1 LG021/1 LG023/1 LG025/1 LG030/2 ME001/9 MP003-086/1 MP003-114/2 PDA005/3 PDA006/3	PDA007/4 PDA033/10 PDB005/2 PDB013/1 PDB022/1 PDB022/2 PDB023/1 PDB025/1 PDB026/3 RL001/1 SEA001/36 SEA041/9 SEA044/2	Gen076: Transportation - Additional discussion of transportation, Washington and Oregon impacts (Edits to revised VV for PDB-026-3) Additional discussion of transportation has been added in Section 2.2.4, Section 5.8, and Appendix H in Volumes I and II of this HSW EIS. A discussion of transporting waste to and from Hanford through the states of Oregon and Washington is included.
LG005/6	LG005/8			Gen077: Transportation - Containers, DOE policy Specialized containers are used for shipment of DOE radioactive and mixed wastes. The are dedicated to transportation of radioactive wastes and are not used for other purposes. DOE Order 460.1A sets out DOE policy on packaging and transportation safety. The Order states that onsite hazardous materials transfers shall comply with the U.S. Department of Transportation (DOT) hazardous materials regulations, or the site- or facility-specific cognizant DOE Operations or Field Office approved Transportation Safety Document that describes the methodology and compliance process to meet equivalent safety for any deviation from the hazardous materials regulations. For offsite hazardous materials packaging and transportation safety, DOE's policy, as stated in DOE Order 460.1A, is that each package and shipment of hazardous materials shall be prepared in compliance with the DOT hazardous materials regulations and applicable tribal, state, and local regulations not otherwise preempted by DOT.

Table 3.3. (contd)

CommentIDs				Subject/Response
L025/6	LG027/1	LG027/2		Gen078: Transportation - DOE policy DOE Order 460.1A sets out DOE policy on packaging and transportation safety. The Order states that onsite hazardous materials transfers shall comply with the U.S. Department of Transportation (DOT) hazardous materials regulations, or the site- or facility-specific cognizant DOE Operations or Field Office approved Transportation Safety Document that describes the methodology and compliance process to meet equivalent safety for any deviation from the hazardous materials regulations. For offsite hazardous materials packaging and transportation safety, DOE's policy, as stated in DOE Order 460.1A, is that each package and shipment of hazardous materials shall be prepared in compliance with the DOT hazardous materials regulations and applicable tribal, state, and local regulations not otherwise preempted by DOT.
PDB024/1				Gen079: Transportation - DOE policy, purpose and relationship of Sections 3, 4, and 5. DOE Order 460.1A sets out DOE policy on packaging and transportation safety. The Order states that onsite hazardous materials transfers shall comply with the U.S. Department of Transportation (DOT) hazardous materials regulations, or the site- or facility-specific cognizant DOE Operations or Field Office approved Transportation Safety Document that describes the methodology and compliance process to meet equivalent safety for any deviation from the hazardous materials regulations. For offsite hazardous materials packaging and transportation safety, DOE's policy, as stated in DOE Order 460.1A, is that each package and shipment of hazardous materials shall be prepared in compliance with the DOT hazardous materials regulations and applicable tribal, state, and local regulations not otherwise preempted by DOT. The purpose of Section 4 is to provide a description of the environment that might be affected by the alternatives described in Section 3. The results of analyses performed to assess potential environmental consequences of implementing the alternatives are presented in Section 5. These comments do not change the assessment documented in this HSW EIS. In some cases, however, the comments have been incorporated.

Table 3.3. (contd)

CommentIDs				Subject/Response
E006/3		L066/3	MP003-052/2	Gen080: Transportation - National hazardous material
E011/1	F049/2	L066/5		shipments, transporting wastes through Washington and
E012/3	F052/2	L069/3	MP003-076/3	Oregon, DOE shipping practices
E017/6	F054/3	L079/1	MP003-077/1	
E019/1	F055/1		MP003-086/2	About 300,000,000 hazardous material shipments take
E021/1	F077/2	LG004/4	MP003-096/3	place every year in the United States. Of those
E029/3		LG006/1	MP003-097/1	shipments, about 3,000,000 involve radioactive
E038/3	HR018/2	LG007/3	MP003-111/3	materials and less than 10,000 involve shipment of
E041/2			MP003-118/2	DOE radioactive materials. Information on the
E044/2	L001/4	ME001/8	MP003-123/3	potential impacts of transporting waste through
E048/3	L009/2	ME001-08/1	MP003-127/2	Washington and Oregon has been added to Section 5.8
	L013/3		MP003-138/3	and Appendix H. Additional information on DOE
F002/3	L014/2		MP003-147/2	shipping practices has been added to Section 2 of this
	L020/8	ML002-04/3	MP003-149/3	HSW EIS.
F012/2	L022/2	ML002-15/2		
F015/2	L023/8	ML002-17/5		
F016/4	L025/5	ML002-27/2		
F016/19	L026/8		PDA006/2	
F017/1	L027/2	MP001/1	PDA009/1	
F022/1	L045/8	MP002-18/2	PDA014/4	
F023/2	L046/3	MP002-23/2	PDB011/1	
F026/5	L049/4		PDB015/1	
F027/2	L053/2	MP003-003/3	PDB015/5	
F029/2	L054/1	MP003-005/2	PDB017/2	
F031/1	L054/7	MP003-023/3		
F034/2		MP003-024/1	SEA010/18	
F035/1		MP003-027/1	SEA018/1	
	L056/3		SEA022/4	
F036/1	L062/3	MP003-036/3	SEA035/4	
F038/4	L063/8	MP003-038/3	SEA041/8	
F039/4		MP003-047/1	SEA042/8	
	L038/3	P003/4	RL002/5	
E052/1	L040/4		RL005/7	shipments, transporting wastes through Washington and
	L065/1			Oregon, DOE waste disposal in other states
		PDA017/1	SEA001/7	
F043/1	L073/10			
F051/2	L097/4	PDA020/6	SEA015/6	place every year in the United States. Of those
F053/1	L104/29	PDA022/7	SEA023/3	shipments, about 3,000,000 involve radioactive
F064/2	L106/8	PDA028/6	SEA032/4	materials and less than 10,000 involve shipment of
F084/4			SEA036/1	DOE radioactive materials. Information on the
	LG005/5	PDA031/6	SEA047/6	potential impacts of transporting waste through
L005/1	LG018/2			Washington and Oregon has been added to Section 5.8
L008/2		PDB025/2		and Appendix H. Additional information on DOE
L017/4	ML002-03/1	PDB026/1		shipping practices has been added to Section 2. DOE's
L018/3		PDB027/1		radioactive waste will continue to be disposed of in
L031/1	MP003-029/4			several states around the country where there are
				existing DOE and commercial disposal facilities. These
				states include Washington, Idaho, Nevada, New
				Mexico, Utah, South Carolina, Tennessee, and Ohio.
				While the probability of malicious events cannot be
				determined, it is expected that the consequences of
				those events would be similar to accidents involving

Table 3.3. (contd)

CommentIDs				Subject/Response
				fires and explosions, which are discussed in Sections 5.8 and 5.11 and Appendixes H and F.
PDA017/2	PDA017/5	PDA017/6		Gen082: Transportation - Suspended shipments of TRU Shipments of radioactive waste to Hanford have been suspended pending the outcome of litigation by the State of Washington against DOE.
E043/4	L020/9 L023/9 L063/9	L064/9 L066/1 L104/28	ME001-03/2 SEA023/6	Gen083: Transportation - Transporting wastes through Washington and Oregon, onsite receipt of LLW, MLLW, and TRU Information on the potential impacts of transporting waste through Washington and Oregon has been added to Section 5.8 and Appendix H. This new information addresses low-level waste, mixed low-level waste, and transuranic waste that might be received from offsite.
  F055/4 L012/10 L026/9 L045/9 L051/4	L080/40 L093/10 L097/24 L098/6 L098/8 L098/9 L102/5	LG005/1 MP003-052/4 RL003/16	SEA013/21 SEA013/23 SEA028/11 SEA049/1	Gen084: Transportation - Transporting wastes through Washington and Oregon, onsite TRU storage pending disposal at WIPP A discussion of the impacts of transporting waste to and from Hanford through the states of Oregon and Washington has been added to this HSW EIS (see Sections 2.2.4, 5.8, and Appendix H). A discussion of the storage of offsite TRU waste at Hanford pending its disposal at WIPP is also included in this HSW EIS (see Section 5 and its associated appendixes).
F027/4	LG005/7	MP002-07/1		Gen085: Waste - Additional wastes generated as part of cleanup, plutonium production ended, TRU-HLW-SNF repository disposal Some additional wastes will be generated as part of the cleanup of Hanford Site and other DOE sites. However, plutonium production, the source of most of the waste created, has stopped at Hanford. TRU waste, high-level waste, and spent nuclear fuel will be sent to underground repositories in other states that have been designed to safely contain the waste.

Table 3.3. (contd)

CommentIDs				Subject/Response
E027/6 L001/3 L020/5	L023/5 L025/4 L026/5 L045/5	L063/5 L064/5 ME001/5	MP003-033/2 SEA010/4	Gen086: Waste - Disposal of DOE waste in other states, net curies to be disposed at Hanford, groundwater monitoring, LLW disposal in lined trenches DOE's radioactive waste will continue to be disposed of in several states around the country where there are existing DOE and commercial disposal facilities. These states include Washington, Idaho, Nevada, New Mexico, Utah, South Carolina, Tennessee, and Ohio. The total amount of radioactivity expected to leave Hanford is much greater than the amount of radioactivity expected to come to Hanford. About 400 MCi of radioactivity is currently onsite. About 375 MCi are expected to be shipped to the Waste Isolation Pilot Plant in New Mexico, Yucca Mountain in Nevada, and other places. Less than 10 MCi would come to Hanford even if all the offsite waste evaluated in the HSW EIS comes to Hanford. Groundwater monitoring is conducted according to DOE Orders, the Resource Conservation and Recovery Act (RCRA) permit, and Tri-Party Agreement (TPA) requirements for the disposal areas. Groundwater monitoring will be expanded as necessary according to agreements between DOE and regulatory agencies to support future waste management operations. DOE has added alternatives for evaluation in this HSW EIS that include disposal of LLW in lined trenches with regulatory-compliant leachate collection systems (see Section 3.1).
E002/1 E011/3 F016/7 F028/4 F042/1 F056/4 F075/1 HR002/11	L004/6 L019/6 L044/3 L054/11 L069/4 L080/34 L080/90 L106/40 LG031/1	ML002-19/1 MP001-06/2 MP002-27/3 MP003-028/1 MP003-055/1 MP003-096/1 MP003-120/2	PDA010/4 PDA013/5 PDA028/4 PDB010/2 PDB016/3 PDB017/1 RL002/3 RL003/27 SEA001/23	Gen087: Waste - Disposal of DOE waste in other states, net curies to be disposed at Hanford, scope consistency with WM PEIS and WIPP SEIS DOE's radioactive waste will continue to be disposed of in several states around the country where there are existing DOE and commercial disposal facilities. These states include Washington, Idaho, Nevada, New Mexico, Utah, South Carolina, Tennessee, and Ohio. The total amount of radioactivity expected to leave Hanford is much greater than the amount of radioactivity expected to come to Hanford. About 400 MCi of radioactivity are currently onsite. About 375 MCi are expected to be shipped to the Waste Isolation Pilot Plant in New Mexico, Yucca Mountain in Nevada, and other places. Less than 10 MCi would come to Hanford even if all the offsite waste evaluated in this HSW EIS were to come to Hanford. The scope of this HSW EIS is consistent with decisions made as part of the Waste Management Programmatic Environmental Impact Statement, the Waste Isolation Pilot Plant Supplemental Environmental Impact Statement, and other environmental documentation. Further

Table 3.3. (contd)

CommentIDs				Subject/Response
				information on alternatives, environmental impacts, cumulative impacts, and other subjects has been added, in part, to respond to comments.
E002/2 E044/1 F007/1 F013/2 F023/1 F068/3 F080/4 F081/9 HR005/3 L004/5 L073/9	LG006/5 LG006/8 ML002-22/1 ML002-26/1 MP002/1 MP002-05/1 MP002-07/3 MP003-038/2 MP003-077/4 MP003-090/1 MP003-090/3 MP003-093/2	MP003-098/1 MP003-101/2 MP003-114/3 MP003-120/1 MP003-125/1 MP003-128/1 MP003-131/1 MP003-137/2 MP003-153/2 P005/2 P007/3 P010/3	PDA012/1 PDA023/3 PDA029/7 PDA033/6 RL005/6 RL006/1 SEA017/1 SEA025/3 SEA047/5	Gen088: Waste - Disposal of DOE waste in other states, net curies to be disposed at Hanford, transportation impact information DOE's radioactive waste will continue to be disposed of in several states around the country where there are existing DOE and commercial disposal facilities. These states include Washington, Idaho, Nevada, New Mexico, Utah, South Carolina, Tennessee, and Ohio. The total amount of radioactivity expected to leave Hanford is much greater than the amount of radioactivity expected to come to Hanford. About 400 MCi of radioactivity are currently onsite. About 375 MCi are expected to be shipped to the Waste Isolation Pilot Plant in New Mexico, Yucca Mountain in Nevada, and other places. Less than 10 MCi would come to Hanford even if all the offsite waste evaluated in this HSW EIS were to come to Hanford. Information on the potential impacts of transporting waste through Washington and Oregon has been added to Section 5.8 and Appendix H.
E036/2 F081/3	L080/64 L080/139 L080/185 L080/359	L097/32 L097/47 L097/48 L097/50	 L106/27 L106/33	Gen089: Waste - Disposed in LLBG prior to and since 1962 Wastes disposed of in the LLBGs since they opened in 1962 are evaluated in this HSW EIS. Wastes disposed of prior to 1962 are addressed as part of the cumulative impacts (see Sections 5.14 and Appendix L). Uncertainties about hazardous chemical constituents in the previously disposed of waste are discussed in Section 3.X. This waste will ultimately go through a CERCLA or RCRA past practice remedial action process prior to closure of the LLBGs.

Table 3.3. (contd)

CommentIDs				Subject/Response
L097/44				Gen090: Waste - Disposed in LLBG prior to and since 1962, Wastes disposed of in the LLBGs since they opened in 1962 are evaluated in this HSW EIS. Wastes disposed of prior to 1962 are addressed as part of the cumulative impacts (see Sections 5.14 and Appendix L). Uncertainties about hazardous chemical constituents in the previously disposed of waste are discussed in Section 3.X. This waste will ultimately go through a CERCLA or RCRA past practice remedial action process prior to closure of the LLBGs. During the trench sampling, industrial hygienists conducted repeated air monitoring at the top of the PVC pipe above the trench—a required health and safety practice for all sampling activities to protect the workers from potentially being exposed during the sampling. After the carbon tetrachloride had been detected in the air at the bottom of the trench, industrial hygienists again monitored the trench to ensure that other workers who entered this area in the burial ground would not be exposed. The measurements for all "organics" in the air above the trench (including carbon tetrachloride and its decay products) showed readings ranging from "not detectable" to 4 ppm—well below the standard set by the Occupational Safety and Health Administration (OSHA) of 10 ppm per day during a 40-hour work week. Samples taken in the "breathing zone" did not show any level of organics. The monitoring at the surface of the trenches indicated that toxic vapors were not emanating from the vent risers.
F042/2 HR010/2	MP003-060/2 MP003-066/1 MP003-068/1	MP003-098/2 MP003-104/2 MP003-150/2	SEA001/21	Gen091: Waste - DOE waste disposal in other states, net curies to be disposed at Hanford DOE's radioactive waste will continue to be disposed of in several states around the country where there are existing DOE and commercial disposal facilities. These states include Washington, Idaho, Nevada, New Mexico, Utah, South Carolina, Tennessee, and Ohio. The total amount of radioactivity expected to leave Hanford is much greater than the amount of radioactivity expected to come to Hanford. About 400 MCi of radioactivity are currently onsite. About 375 MCi are expected to be shipped to the Waste Isolation Pilot Plant in New Mexico, Yucca Mountain in Nevada, and other places. Less than 10 MCi would come to Hanford even if all the offsite waste evaluated in the HSW EIS comes to Hanford.

Table 3.3. (contd)

CommentIDs				Subject/Response
L080/195 L091/14 L097/58 L098/13	L102/20 L106/15 L106/34 L106/35	PDB016/1 RL003/11	SEA010/7	Gen092: Waste - Evaluation of wastes disposed prior to 1970 In general, waste disposed of prior to 1970 will be addressed through Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) response activities or other NEPA documentation, as appropriate. Cumulative impacts of waste remaining onsite, including waste disposed of prior to 1970, are addressed in Section 5.14 and Appendix L of the HSW EIS. Uncertainties regarding the inventory of wastes are discussed in Section 3.5.
E006/1 E007/1 E009/1 E010/3 E014/1 E016/1 E021/2 E024/1 E027/5 E031/1 E034/1 E035/6 E038/1 E039/1 E039/2 E040/1 E043/1 E045/1 E047/1 E048/1 E050/1 E051/1 F002/1 F004/3	F005/1 F006/1 F008/1 F010/1 F010/3 F011/2 F012/1 F016/5 F018/3 F019/1 F023/4 F024/2 F025/1 F025/4 F026/2 F029/1 F030/5 F033/1 F037/2 F037/4 F038/1 F039/1 F041/2 F045/1 F050/2 F054/1	F055/7 F056/1 F065/2 F065/5 F065/7 F071/5 F073/5 F079/7 F081/2 F081/7 F084/2 HR001/3 HR003/4 HR007/3 L006/2 L017/5 L022/1 L027/1 L030/2 L036/1 L039/1 L044/1 L054/5	L058/1 L062/4 L065/2 L068/2 L073/5 L080/36 L080/39 L080/160 L080/177 L087/1 L097/38 L104/12 L104/44 L104/49 L106/42 PDA005/1 PDA014/3 PDB015/2 RL001/3 SEA001/28 SEA010/15	revised draft HSW EIS The revised draft HSW EIS evaluates various forecast waste quantities that include only Hanford-generated waste, in addition to varying amounts of offsite waste. This evaluation reflects the uncertainty in waste quantities that Hanford might receive from offsite. The inclusion of a Hanford-only waste volume provides the basis for determining the incremental impacts of offsite waste. See Section 3.2 for a discussion of the different waste volumes addressed in the HSW EIS. The evaluations of groundwater impacts in Section 5.15 of the draft HSW EIS include the impacts of the wastes to be managed within the scope of the HSW EIS NEPA review, as well as the CERCLA wastes disposed in the Hanford ERDF. Analysis indicates that these wastes could be handled without complicating future remediations, or diverting resources or disposal capacity from other Hanford cleanup activities.
E004/8 F059/2 F059/3	L043/3 L102/13	RL008/3	SEA023/4 SEA028/9	Gen094: Waste - Hanford-only waste evaluation The “no import of out of state waste” scenario is evaluated as the Hanford Only waste volume that has been added to this HSW EIS.
F016/13 F030/4	L057/2 L059/3 L102/19 L106/21 L106/43	ME001/6 MP002/2	RL001/21 SEA001/31	Gen095: Waste - Hanford-only waste evaluations, carbon tetrachloride discussion Evaluation of a Hanford Only waste volume has been added to this HSW EIS. The Hanford Only waste volume assumes that no more waste would be received from offsite. Further information on alternatives, environmental impacts, cumulative impacts, and other subjects has been added. Discussion of carbon

Table 3.3. (contd)

CommentIDs				Subject/Response
				tetrachloride has also been added to this HSW EIS.
L057/12				Gen096: Waste - Hanford-only waste evaluations, terrorist attacks The "no import of out of state waste" scenario is evaluated as a result of evaluating the Hanford Only waste volume that has been added to this HSW EIS. In response to comments, DOE included a discussion of the potential impacts of deliberate acts of sabotage or terrorist attacks in Section 5.8 and Appendix H of this EIS.
E027/4 F003/1 F012/3 F046/5	L018/4 LG031/2	MP003-043/2 MP003-070/1 MP003-082/2 MP003-119/1	PDA023/1 SEA048/4	Gen097: Waste - HLW and spent nuclear fuel will not be disposed at Hanford power facilities will not be disposed of at Hanford.
L019/3 L093/5	LG003/5 LG006/2 LG006/14	ME001/3	MP001/4 MP002-02/1	Gen098: Waste - Net curies to remain at Hanford The total amount of radioactivity expected to leave Hanford is much greater than the amount of radioactivity expected to come to Hanford. About 400 MCi of radioactivity are currently onsite. About 375 MCi are expected to be shipped to the Waste Isolation Pilot Plant in New Mexico, Yucca Mountain in Nevada, and other places. Less than 10 MCi would come to Hanford even if all the offsite waste evaluated in this HSW EIS were to come to Hanford.
E005/2 E006/5	L051/6	PDA007/1	SEA001/29	Gen099: Waste - Net curies to remain at Hanford, evaluation of additional alternatives The total amount of radioactivity expected to leave Hanford is much greater than the amount of radioactivity expected to come to Hanford. About 400 MCi of radioactivity is currently onsite. About 375 MCi are expected to be shipped to the Waste Isolation Pilot Plant in New Mexico, Yucca Mountain in Nevada, and other places. Less than 10 MCi would come to Hanford even if all the offsite waste evaluated in this HSW EIS were to come to Hanford. Additional disposal alternatives, including alternatives for the disposal of low-level waste, have been analyzed. Potential environmental impacts of these additional alternatives are presented in Section 5 and related appendixes.
L080/25 L091/40	L097/49	L102/6 L106/14		Gen100: Waste - Pre-1970 LLBG waste Waste disposed of in the Low Level Burial Grounds, including waste disposed of prior to 1970, are evaluated in this HSW EIS. Wastes disposed of elsewhere are addressed as part of the cumulative impacts. Further

Table 3.3. (contd)

CommentIDs				Subject/Response
				information on cumulative impacts has been added to Section 5.14 and Appendix L.
L091/22	L106/20			Gen101: Waste Minimization Waste minimization and pollution prevention practices are used at all DOE sites to control waste management costs and to comply with regulatory requirements. The NEPA documents relevant to the Hanford Solid Waste EIS are identified in Section 1.5. The most comprehensive NEPA document addressing DOE waste management practices is the 1997 WM PEIS. DOE's pollution prevention program is evaluated in Appendix G of the WM PEIS.
F057/1	L092/11 L098/7	RL001/14 RL005/4		Gen102: WM PEIS - Comprehensive national evaluation of DOE waste management, DOE decisions, public availability The Waste Management PEIS was a comprehensive evaluation of DOE nationwide waste management activities, and DOE determined there was sufficient information to make decisions regarding the sites that were suitable for long-term waste management missions. The WM PEIS was widely distributed, and documents cited in the WM PEIS were made available at numerous libraries and reading rooms in Washington and Oregon. Likewise, documents cited in this HSW EIS are available in public reading rooms listed in published notices and this document.

Table 3.3. (contd)

CommentIDs				Subject/Response
E007/3	HR019/3	ML002-08/1	PDA030/2	Gen103:
E027/3	HR020/1	ML002-09/1	PDA030/3	
E029/4	HR022/5	ML002-10/1	PDA030/7	Thank you for your comment.
E030/2		ML002-13/1	PDA031/11	
E036/3	L005/3	ML002-15/1	PDB001/1	
E037/3	L007/2	ML002-20/1		
E039/3	L009/6	ML002-25/2	PDB003/1	
E040/3	L010/4	MP001-05/1	PDB003/3	
E041/3	L012/1	MP001-08/1	PDB006/1	
	L016/2	MP001-10/1	PDB006/2	
F001/4	L017/6	MP001-11/1	PDB008/2	
F005/2	L019/4	MP001-19/1	PDB010/3	
F005/9	L019/5	MP001-21/1	PDB010/4	
F007/3	L022/3	MP001-23/1	PDB012/1	
F011/1	L023/13	MP001-24/1	PDB012/9	
F011/6	L029/3		PDB014/3	
F013/3	L030/3	MP001-59/1	PDB015/3	
F016/15	L032/1	MP002-01/1	PDB016/2	
F018/5	L032/3	MP002-11/1	PDB019/1	
F021/1	L032/4	MP002-24/1		
F023/6	L032/5	MP002-24/2	RL001/6	
F023/7	L034/4	MP003-001/3	RL002/1	
F026/4	L034/6	MP003-011/2	RL002/9	
F028/3	L036/4	MP003-011/3	RL009/1	
F029/4	L039/3	MP003-012/2	RL009/2	
F029/7	L041/3	MP003-019/1		
F030/3	L046/4	MP003-035/1	SEA002/3	
F031/4	L048/2	MP003-038/1	SEA002/5	
F034/4	L060/5	MP003-044/3	SEA009/2	
F038/2	L067/1	MP003-046/1		
F038/5	L067/4	MP003-053/4	SEA011/1	
F039/2	L071/3	MP003-056/1	SEA012/1	
F040/1	L075/1	MP003-056/3	SEA012/2	
F041/3	L075/3	MP003-059/1	SEA015/3	
F042/5	L078/1	MP003-063/2	SEA015/4	
F042/6	L078/2	MP003-090/2	SEA015/5	
F043/3	L078/3	MP003-100/1	SEA020/1	
	L080/91	MP003-121/1	SEA020/4	
F055/6	L080/98	MP003-122/3	SEA021/1	
F059/4	L080/152	MP003-128/2	SEA022/2	
F060/1	L080/179	MP003-129/1	SEA022/5	
F061/1	L084/1	MP003-135/1		
F061/3	L084/2	MP003-138/1	SEA024/4	
F061/7	L084/3		SEA024/5	
F064/3	L085/7	P011/3	SEA025/7	
F067/2	L092/1		SEA027/2	
F067/4	L092/5	PDA002/1	SEA027/4	
F075/2	L092/9	PDA003/1	SEA029/1	
F078/1	L097/21	PDA004/2	SEA029/3	
F079/1	L106/3	PDA004/3	SEA031/1	
F081/10	L106/59	PDA005/9	SEA031/2	
F081/12		PDA012/2	SEA032/5	

Table 3.3. (contd)

CommentIDs				Subject/Response
F083/2	LG003/1	PDA012/3	SEA033/2	
F084/5	LG003/2	PDA013/3	SEA034/1	
F085/1	LG003/3	PDA014/1	SEA036/4	
F085/2	LG003/8	PDA017/8	SEA036/5	
F085/3	LG003/9	PDA020/2	SEA036/6	
F086/3	LG003/10	PDA022/1	SEA037/1	
	LG006/3	PDA022/9	SEA042/3	
HR001/1	LG006/13	PDA023/4	SEA044/1	
HR002/1	LG006/15	PDA025/1	SEA044/6	
HR004/3	LG007/7	PDA026/1	SEA046/1	
HR004/5	LG013/3	PDA026/2	SEA047/2	
HR007/1		PDA027/5	SEA047/4	
HR011/2	ME001-02/1	PDA028/9	SEA047/7	
HR015/2	ME001-04/2	PDA029/2	SEA047/8	
HR016/2	ME001-07/1	PDA029/4	SEA048/1	
HR018/3	ME001-08/3	PDA029/5	SEA048/2	
HR019/1	ME001-08/4	PDA030/1	SEA048/6	
HR019/2				