RESPONSIVENESS SUMMARY

DOH Publication 320-031

VOLUME II

FINAL ENVIRONMENTAL IMPACT STATEMENT
COMMERCIAL LOW-LEVEL RADIOACTIVE WASTE DISPOSAL SITE
RICHLAND, WASHINGTON

May 28, 2004

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INTRODUCTION

There are two volumes of the Final Environmental Impact Statement (EIS) for the Commercial Low-Level Radioactive Waste Disposal Site, Richland, Washington. Volume I is the EIS and appendices. Volume II is the Responsiveness Summary. The Responsiveness Summary contains the comments and responses on the September 13, 2000 Draft EIS. The 45-day public comment period for the Draft EIS began September 25, 2000 and was extended through November 30, 2000. During this period, Washington Department of Health (DOH) and the Washington Department of Ecology (Department of Ecology) held public hearings in Bellevue, Kennewick, and White Salmon.

The Responsiveness Summary is divided into two parts. The first part contains comments and responses organized by subject matter. Where possible, the state tried to keep the original wording of all comments. In some instances, comments were shortened or re-written for clarity. Where practical, duplicative comments were combined.

The list of persons who submitted comments is arranged alphabetically and each commenter is assigned a number. These numbers are included at the end of each comment in Sections 1 through 13 to identify the author. The original comments submitted to the agency are included in the back of this document. The commenter number arranges the original written comments in numerical order. Oral comments submitted during the three public hearings are included in the transcripts following the written comments.

Literature references in the Responsiveness Summary are used sparingly. Instead, responses direct the reader to the applicable section in the Final EIS, which does contain specific references.

ACRONYMS

Act	Low-Level Radioactive Waste Policy Act of 1985
AEA	Atomic Energy Act
AEC	Atomic Energy Commission
ALARA	As Low as Reasonably Achievable
Amendments Act	Low-Level Radioactive Waste Policy Act of 1985, Amended
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CLUP	Comprehensive Land Use Plan
CNI	California Nuclear, Inc.
DEIS	Draft Environmental Impact Statement
DOH	Washington State Department of Health
DS	Determination of Significance
DUST	A Computer Code
ECB	Engineered Concrete Barriers
EIS	Environmental Impact Statement
EMS	Emergency Management Services
EPA	U.S. Environmental Protection Agency
FOLAT	A Computer Code
GWSCREEN	A Computer Code
HAEIF	Hanford Area Economic Investment Fund
HMS	Hanford Meteorological Station
ICRP	International Commission on Radiation Protection
JLC	Joint Legislative Committee
LLC	Limited Liability Company
LLRW	Low-Level Radioactive Waste
LNT	Linear No Threshold
MCL	Maximum Contaminant Level
MDC	Maximum Detectable Concentration
MEI	Maximally Exposed Individual
MOU	Memorandum of Understanding
MTCA	Model Toxics Control Act
N/A	Not Applicable
NARM	Naturally Occurring or Accelerator Produced Radioactive Material
NCRP	National Commission on Radiation Protection
NECO	Nuclear Engineering Company
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRC	U.S. Nuclear Regulatory Commission
NUREG	Publications by the U.S. Nuclear Regulatory Commission
OSHA	Occupational Safety and Health Administration
PC&M	Perpetual Care and Maintenance

PNNL	Pacific Northwest National Laboratory (Formerly “PNL”)
RADTRAN	A Computer Code
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
SEPA	State Environmental Policy Act
SNM	Special Nuclear Material
TCE	Trichloroethene
TEDE	Total Effective Dose Equivalent
TLD	Thermoluminescent Dosimeter
TNC	The Nature Conservancy
TRU	Transuranic
TRV	Trojan Reactor Vessel
UNSAT-H	A Computer Code
US Ecology	US Ecology, Inc.
USDOE	U.S. Department of Energy
US DOT	U.S. Department of Transportation
WAC	Washington Administrative Code
WISHA	Washington Industrial Safety and Health Act
WUTC	Washington Utilities and Transportation Commission

LIST OF COMMENTERS

Groups, businesses, agencies, and individuals who submitted comments are listed in alphabetical order by the last name of the author or principal submitter.

Groups, Businesses, and Agencies

(1) University of Washington (Stanley Addison)
(2) Benton County (Gary Ballew)
(3) City of Kennewick (James R. Beaver, Mayor)
(4) Benton County Board of County Commissioners (Max Benitz, Chairman)
(5) Energy Sciences & Engineering (John Brodeur, Consultant for Heart of America NW)
(6) Citizens for Medical Isotopes
(7) Energy Northwest (D.W. Coleman, Manager of Regulatory Affairs)
(8) Columbia River Keeper (Greg DeBruler)
(9) Department of the Navy (G.A. Drevniak, Director of Radiological Control)
(10) U.S. Department of Energy, Richland (USDOE) (Paul X. Dunigan, Jr., NEPA Compliance Officer)
(11) Citizens for Medical Isotopes (Amy Evans, Executive Director)
(12) City Of Pasco (Michael L. Garrison, Mayor)
(13) Hanford Communities Governing Board (Larry Haler, Chairman)
(14) Fluor Hanford (T.J. Harper, Vice President of Site Services)
(15) US Ecology, Inc. (Thomas R. Hayes, Vice President)
(16) Tri-City Industrial Development Council (Harold Heacock)
(17) National Association of Cancer Patients (Nicki Hobson, Executive Director)
(18) Hanford Action of Oregon (Robin Klein)
(19) Columbia Gorge Audubon Society (Daniel Lichtenwald)
(20) Department of Fish and Wildlife (Jay McConnaughey)
(21) Portland General Electric (Tom Meek)
(22) Washington Public Employees for Environmental Responsibility (PEER) (Lea Mitchell, Director)
(23) Siemens Power Corporation (James Nordahl, President and CEO)
(24) Benton County (Claude Oliver, Commissioner)
(25) National Association of Cancer Patients (NACP) (Marlene Oliver)
(26) *Comment number deleted*
(27) West Richland (Jerry K. Peltier, Mayor)
(28) Lampson International (Brian Peppindoneau, Director of Contracts & International Business)
(29) Heart of America Northwest (Gerald Pollet, Executive Director)
(30) Health Physics Society (Cascade Chapter) and Oregon State University (David Pratt)
(31) Benton PUD (James Sanders, General Manager)
(32) Hanford Atomic Metal Trade Council (Keith Smith)
(33) Hanford Area Economic Investment Fund Committee (HAEIF) (Carl Strode, Chair)

(34) City of Connell (Art Tackett, City Administrator)
(35) Tri-City Industrial Development Council (TRIDEC) (Sam Volpentest, Executive Vice President)
(36) Heart of America Northwest (Amber Waldref)
(37) Sierra Club, Cascade Chapter (Carole Woods)
(38) Washington Physicians for Social Responsibility (Ruth Yarrow)

General Public

(39) Herald Anderson
(40) Eldon Ball
(41) Scott Bergeron
(42) Maurita Bernet
(43) Kimberly Burkland
(44) Kathy Carlson
(45) Michael Contini
(46) Scott Corvin
(47) Dennis Fitzgerald
(48) Shelly Hensley
(49) Michelle Hoffman
(50) Krista Thie Hoyt
(51) Robert Jackson
(52) Denise Jacobson
(53) Robert L. James
(54) Pamela Jansen
(55) Albert Kaufman
(56) David Klos
(57) Dr. Stella Kondilis
(58) Mike Lane (formerly with US Ecology)
(59) Hyun Lee
(60) Deacon George Lukach
(61) David McGraw
(62) Joseph L. Miller, M.D.
(63) Edward O'Donnell, Ph.D.
(64) Cheryl Paglieri
(65) James Paglieri
(66) Barbara J. Pereira
(67) Shari and Dan Peterson
(68) Laurel Piipo
(69) Eric L. Platz, M.D.
(70) Kathryn Roberg
(71) Gordon Rogers
(72) Lynora Saunders
(73) Elizabeth See
(74) Molly See
(75) Don Segna
(76) Rebecca Stonestreet
(77) Kay Thode
(78) Jim Watts (Former President, PACE Union Local 8-369)
(79) Yellow Thunder Woman

1.0 GENERAL COMMENTS

1. COMMENT: What are the benefits of having this site? (76)

   RESPONSE: The commercial low-level radioactive waste (LLRW) site provides disposal capacity for LLRW wastes that are generated within the member states of the Northwest and Rocky Mountain compacts. Facilities that dispose of waste at the commercial LLRW site include a nuclear power plant, research firms, hospitals, universities, and other businesses. About 90% of the waste going to the site is generated in Washington and Oregon. Fees associated with waste disposal generate revenue for the Hanford Area Economic Investment Fund and Benton County. These funds are used to diversify businesses located in the three cities (Kennewick, Richland, and Pasco) that form the Tri-Cities.

2. COMMENT: Why can't the desert in Nevada handle this waste? (46)

   RESPONSE: Nevada is not in the Northwest Compact and there is no licensed commercial LLRW site in the state of Nevada. The facility located in Beatty, Nevada, closed in 1993.

3. COMMENT: We should allow the lowest amount of waste, maybe only what's generated in Washington and Oregon to be disposed at the commercial LLRW site. (40)

   RESPONSE: The Federal Low-Level Radioactive Waste Policy Amendments Act allows the Northwest Compact to exclude waste from states located outside the compact. Federal law does not allow the state to only authorize waste from Washington and Oregon. Currently, the site takes LLRW from 11 states. Naturally Occurring and Accelerator Produced Radioactive Material (NARM) is not included in the Amendments Act. NARM is subject to the Commerce Clause of the U.S. Constitution and cannot be excluded from the commercial LLRW site on a state-by-state basis.

4. COMMENT: All indicators are that the site is safe, sane, well defined and we want you to continue your oversight and good reporting to the public on what this site is all about. (24)

   RESPONSE: Thank you for your comment.

5. COMMENT: PEER believes the EIS is inadequate. License renewal, final closure plans, lease agreements and other associated actions must not be finalized until the state accurately assesses the situation and presents viable alternatives. Due to substantial errors in the EIS and the complexity of the topic, WA PEER requests the state to list all modifications and append all substantive comments to the final EIS, add to the public record all substantive comments provided by Ecology, Health, and technical staff, respond individually to all

substantive comments, define corresponding changes in the EIS or clearly state why no changes were made, hold additional public hearings on the final EIS. (22)

RESPONSE: The Final EIS (Volume I) includes a Readers Guide to explain the revisions that were made to the Draft EIS and included in Final EIS. Individual comments and responses on the Draft EIS are presented in the Responsiveness Summary (Volume II). Public hearings will not be held on the Final EIS. However, public hearings will be held during rulemaking for diffuse NARM.

6. COMMENT: In general, the EIS is a very poor and incomplete assessment of the risks and alternatives; and the phase 1 and 2 characterization, which is the basis of the EIS, is extremely shallow and provides very little understanding of the hydrogeologic system or the contamination. To make matters worse, what little geologic data that was obtained from the characterization was not used to develop the models or perform the risk assessment. For instance, the large liquid source terms represented by the liquids in the barrels and the caissons was not considered, there was no assessment of the plutonium, TCE, chloroform, and other contaminants in the vadose zone and groundwater, and there are conclusions, either stated or implied, about contaminant migration and distribution that have no basis. The EIS does not discuss uncertainties and has not effectively determined the sensitivity of the risk assessment. As a result, this reviewer questions the competency of the State organizations, each as a whole, represented by the Manager of Ecology's Nuclear Waste Program and by DOH's Director of the Division of Radiation Protection, both of whom approved the EIS, and by the principal authors of the EIS and phase 1 and 2 US Ecology Site Investigation Report. (5)

RESPONSE: In the Final EIS, the state has addressed many of the issues you describe, use of the Phase I and Phase 2 Site Investigation Data for recalibrating the groundwater model.

The commercial LLRW site has not accepted mixed waste since 1985, and will not accept mixed waste in the future under any licensing alternative. As a result, completion of a non-radioactive hazardous substance risk assessment is not necessary to finalize EIS alternatives for relicensing and establishing diffuse NARM volume limits.

The Department of Ecology will complete a risk assessment for non-radioactive hazardous contaminants such as TCE and chloroform, following a Model Toxics Control Act (MTCA) investigation beginning the summer of 2004. The preferred cover schedule alternative uses a phased construction approach to allow incorporation of the results from the 2004 MTCA investigation into the final cover design without removing or disturbing the cover. The results of the 2004 MTCA investigation will help determine whether remedial actions related to non-radioactive hazardous substances are necessary at the commercial LLRW site.

Both the Draft EIS and the Final EIS contain an uncertainty analysis for the dose assessment. The uncertainty analysis for the onsite rural resident adult showed that the single-point dose estimates were at the 95 percentile. For the offsite person, the uncertainty analysis showed that the single-point estimates were at some percentile less than 95%. The uncertainty analysis also showed that the most probable doses were significantly lower than all the single-point dose estimates. Please see Appendix II of the Final EIS for the radiological uncertainty analysis. Information from this analysis can also be found in the Final EIS, Section 4.4 of Volume I, Post-Closure Radiological Dose.

7. COMMENT: Please use your position to prevent further dumping, further pollution, and to see that the proper steps are taken to clean up what has already ruined so much life and continues to do so. We need to look for and support new ways of doing business that are truly healthy for all. (42)

   RESPONSE: Thank you for your comment.

8. COMMENT: We need to repair the damage done by past policies, set clear limits now, and map a more intelligent course for the future. (52)

   RESPONSE: Thank you for your comment.

9. COMMENT: It is vital that governmental agencies see to it that Hanford radioactive waste is fully contained. Industry will not do it. Thank you for your efforts along these lines and please continue until it is all cleaned up. (50)

   RESPONSE: Thank you for your comment.

10. COMMENT: Your main job in this EIS is to identify uncertainties, identify potential problems, and do a sensitivity analysis to try to understand what potential impact those problems could have. I don't see this in the EIS. (5)

    RESPONSE: Please see Appendix II of the Final EIS for the radiological uncertainty analysis. Information from this analysis can also be found in the Final EIS, Section 4.4 of Volume I, Post-Closure Radiological Dose.

    Hypothetical impacts from the commercial LLRW site, and uncertainties associated with those impacts, are best presented in the context of the surrounding 586-square mile Hanford Site. The commercial site is a 100-acre site in the middle of the much larger contaminated central plateau area of Hanford. USDOE has designated the central plateau for Industrial-Exclusive use in the final Hanford comprehensive Land Use Plan (CLUP) EIS (USDOE 1999). It is likely that waste management activities, other than the commercial site, would make the entire central plateau unfit for residential use or other long-term uses for an indefinite period. In this context, hypothetical impacts from the commercial site would contribute little, if any, to the overall impact on public

health. USDOE is planning to use institutional controls to restrict public access to the central plateau for the foreseeable future. It will be every future generation's responsibility to ensure that these controls remain in place for as long as necessary.

11. COMMENT: Comments provided to the agencies during scoping are not presented, or responded to. Examples include comments of the Oregon Hanford Waste Board regarding the rollover provisions for NARM waste and of our organizations regarding consideration of a zero quantity for NARM or limiting NARM to the quantities generated annually in Washington and Oregon. Other examples include route specific concerns for the dramatic increase in truckloads of NARM waste that would cross Oregon's Blue Mountains (including cumulative impacts in conjunction with other USDOE decisions to increase waste shipments to and from Hanford), use of 1-90 through downtown Spokane, and the safety violation record of shippers/trucking firms importing waste to the site. (29)

    RESPONSE: The state considered all comments that were received during the 1997 scoping period. A summary of scoping comments was mailed to commenters in July 1997. Scoping comments on transportation were addressed both in the Draft EIS and in the Final EIS. The state did not receive any specific comments during scoping that addressed a zero quantity of diffuse NARM. However, this alternative has been included in the Final EIS, based on comments received during the public hearings on the Draft EIS.

12. COMMENT: Significant conclusions from all the public records on this site should be included in the EIS. The EIS fails to mention the recommendations of a 1985 report to the Joint Legislative Committee on Science and Technology of the Washington State Legislature that a groundwater system be installed and that liquid releases inside the trenches be monitored. This report is not mentioned in Section 2.2, which discusses Regulatory, Legal, and Policy Considerations. (22)

    RESPONSE: The state consulted the 1985 report to the Joint Legislative Committee on Science and Technology during development of the Final EIS. Please see Section 2.3, Waste, in the Final EIS.

13. COMMENT: Pg 78. Here and elsewhere these "Summary of Impacts…" appear to be qualitative summaries of impacts, but there does not appear to be a quantified basis on which to make these conclusions. (10)

    RESPONSE: The shaded text you refer to is included at the end of the sections in Chapters 4, 5, and 6 and is entitled, "Preferred Alternative Impacts, Mitigation Measures, and Significant Unavoidable Adverse Impacts". This text has been revised in the Final EIS to be a quick reference for the impacts of the preferred alternatives. The text in the shaded areas summarizes the discussion in the various sections.

14. COMMENT: Tables 2, 3, 4 and 5. Many of the aspects considered are insignificant and appear to be added simply to complete the matrix. To simplify, I suggest removing mitigation measures as well as significant unavoidable adverse impacts from the matrix. (10)

    RESPONSE: In the Final EIS, these tables are identified as Tables 1.A, 1.B, 1.C, and 1.D. The state has simplified these tables to include only those impacts determined to be significant.

15. COMMENT: Appendix 1 states that the maximum dimensions for the burial trenches are 1000 feet. Earlier the reader was led to believe that the trenches were 800 feet in length. Please explain the difference of 200 feet. (10)

    RESPONSE: Unless otherwise approved by DOH, the radioactive materials license issued to the site operator limits trench length to 1000 feet. The 800-foot reference in the Draft EIS, Section 1.1, is the typical as-built trench length.

16. COMMENT: I suggest replace “pending” with proposed. The word “pending” gives the impression that the decision had already been made. (10) (29)

    RESPONSE: The word “pending” has been replaced with “proposed” in the Final EIS.

2.0 SEPA

17. COMMENT: The Draft EIS is legally inadequate under the standards of the State Environmental Protection Act (SEPA), which requires disclosure and consideration of all reasonably foreseeable impacts of proposed actions; all reasonable alternatives to those actions and their impacts; disclosure of known data indicating that the facility has already had significant impacts to human health or the environment; and examination of the cumulative impacts of related decisions, whether or not they are by the same agency. (29)

    RESPONSE: The Final EIS has been expanded to include more alternatives and more information on foreseeable impacts. In the Final EIS, cumulative impacts are discussed in Section 6.7 of Volume I.

18. COMMENT: The alternatives presented do not comply with SEPA requirements because they do not include actions that could feasibly attain or approximate a proposals objective but at a lower environmental cost or decreased level of environmental degradation. The alternatives propose covers that will help remedy short-term contamination from infiltration but do not address long-term contamination from liquid and hazardous wastes in the landfill. (22)

RESPONSE: The EIS includes a range of cover designs for closing the site. All but one of the alternatives is designed to address long-term impacts. Please see Section 3.0, Description of Proposed Actions and Alternatives, in Volume I of the Final EIS. Any remedial actions, in addition to covering the waste, will be defined following completion of the 2004 MTCA investigation.

19. COMMENT: SEPA requires that an EIS directly discuss uncertainties. The EIS should be modified to clarify the nature of the uncertainty, how it will be resolved, and if it will not be resolved, the consequences. (22)

RESPONSE: The Final EIS discusses the uncertainty of the hypothetical post-closure doses in Section 4.4 of Volume I, Post-Closure Radiological Dose. Uncertainty is also discussed in the Radiological Risk Assessment, Appendix II.

20. COMMENT: Comply with SEPA by discussing precedents that will be set by the proposal and associated alternatives you are putting forth. (22)

RESPONSE: The state does not consider the proposals and alternatives to be binding on any other site, or binding on future decisions at this site. Each of the three proposed actions analyzed in this EIS involves facts and circumstances unique to the commercial LLRW site.

21. COMMENT: The State should not hide behind SEPA language that allows the dismissal of environmental impacts that are speculative. If available information had been utilized, the presence of hazardous wastes at the site and in the groundwater would not be considered “speculative”. (22)

RESPONSE: Data indicate the presence of certain non-radioactive hazardous contaminants in the groundwater and vadose zone. The data are not complete enough for the Department of Ecology to project future impacts on public health or the environment. The Department of Ecology will investigate the impacts of non-radionuclide hazardous wastes at the commercial LLRW site during the 2004 MTCA investigation. Past disposal of hazardous wastes is discussed in Section 2.3.4 of Volume I, Non-Radiological Hazardous Waste, in the Final EIS.

22. COMMENT: The EIS must comply with SEPA. Include a worst case analysis scenario where the landfill is capped, hazardous waste seeps into the groundwater at amounts greater than estimated, the radioactive waste standards used are determined to be inadequate to protect public health, and due to job opportunities in the clean-up industry, your children’s children move to the area. (22)

RESPONSE: The state supports the scenarios used in the EIS as being reasonably conservative and therefore in compliance with SEPA.

23. COMMENT: We urge the State of Washington to move expeditiously to complete the EIS process. (16) (13) (4) (23) (12)

RESPONSE: Thank you for your comment.

3.0 DESCRIPTION OF WASTE

3.1 Source Term

24. COMMENT: I do not believe the comment made that you have 99 percent knowledge of the waste that was dumped in the site. How much characterization was done back in the 1960's, 1980's and 1990's? Probably very little. (8)

RESPONSE: It is more accurate to state that there is 99% certainty that the quantity of waste used as the basis for analysis in the EIS is not greater than the inventory used. This is because where the earlier records were unclear, the agency always tried to err on the side of over-estimating the source term.

25. COMMENT: Inventories of the specified radionuclides should be given. That may help explain why the concentrations are higher for the Filled Site alternative with proposed cover closed in 2215 (date?) than the close now alternative with the site soils cover. (10)

RESPONSE: Source term relevant to the proposed actions in the EIS is included in Table 2.D: Selected Radioactive Inventories for the Commercial LLRW Site, in the Final EIS. The table shows the projected increase in inventory for closing the site in 2056 and in 2215.

26. COMMENT: The source term used in the analysis should be appended to the EIS, both in terms of activity and volume by waste type. It appears there are about 20 years of waste receipts for which little is known as to its characterization. In the case of the nearly 20 years of unclassified waste, it could be asserted that a reasonable estimate would be activity proportional to recent acquisitions plus any known special cases; e.g. radium wastes. (10)

RESPONSE: The records for the *first* 20 years of operation are not as complete or thorough as for the *past* 20 years. However, DOH made conservative estimates where records were incomplete. Source term used in the Radiological Risk Assessment is discussed in Appendix II and in Section 4.4.2, Source Term, in the Final EIS. Please see the response to Comment #24.

27. COMMENT: In your future volume estimates, consider the growth of companies that rely on radionuclides, and also consider that word is getting out that this site is here and new companies may want to relocate to this area. (25)

RESPONSE: The volume predictions made in the EIS are based upon the average volume of waste received for the years 1992 through 1999. Based on the volume of waste received for 2000 through the first half of 2003, future volume estimates included in the EIS are conservatively high.

28. COMMENT: Footnote 13. It is not clear why 2172 was selected for the curie content estimate. The rest of the document discusses closure in 2056, thus setting closure plus 100 years at 2156. (10)

RESPONSE: Footnote 13 of the Draft EIS should state the year as 2163. The basis for 2163 is based on a start closure date of 2056, seven years for actually closing the commercial LLRW site, and a minimum of 100 years of institutional controls. (Please note, the footnote numbering has changed in the Final EIS.)

3.2 Liquid Waste

29. COMMENT: The 1985 US Ecology Site Environmental Review indicates that from 1978 to 1980 (Table 2-1 and pg 2-30), approximately 25% of the waste shipped to and received at the Disposal Site was in the liquid phase. This liquid was either dumped directly into caissons, or pits, or it was buried in 55-gallon drums. The drums were tossed into the pit or simply placed in the pit at any angle with a crane, and many of the drums began leaking as soon as they were put in the pits. Other drums rusted and leaked or will eventually leak. This very large volume of liquid waste and the liquid waste that will result when the remaining drums leak is not considered as a source term in the EIS and specifically in the risk assessment. Therefore, this EIS must be considered to be inaccurate and inadequate for the intended purpose of justifying approval of the closure plan and approval of continued operation of the Disposal Facility. Questions remain about the environmental impacts of these liquid wastes, and the EIS must answer those questions. (5)

RESPONSE: A discussion of liquid wastes was included in Section 2.3.1.3, Liquid Wastes, in the Final EIS. The 1985 US Ecology Site Environmental Review states that liquid wastes destined for disposal at the commercial LLRW site were solidified before shipment and disposal. Free liquids have never been allowed for disposal at the commercial LLRW site. There has always been a requirement for liquids to be solidified, absorbed, or surrounded by enough absorbent to absorb at least twice the amount of liquid that was contained in glass, earthenware, or other similar inner containers.

30. COMMENT: Include a discussion of leaking containers that were buried in the trenches. (22)

RESPONSE: Please see the response to Comment #29.

31. COMMENT: The EIS should address documented prior improper disposal of liquid wastes (including liquid waste disposal caissons, 55-gallon barrels of liquid wastes and organic solvents in scintillation liquids, and hazardous wastes) which will mobilize other wastes and cause their migration to groundwater at rates far greater than acknowledged. (29)

RESPONSE: The state is not aware of the documentation you refer to on liquid wastes. Please see the response to Comment #29.

32. COMMENT: Questions remain about the environmental impacts of four caissons at the facility. These caissons are located between trenches 3 and 4 and are composed of 30 ft deep by 24-inch diameter corrugated steel pipe. These caissons are discussed in the 1985 US Ecology Environmental Review in the DOE Hanford Site Report. They were used to dispose of radioactive and hazardous liquid waste that was dumped into the caissons and allowed to infiltrate into the sediment. There is no discussion about these caissons in the EIS or in the phase I and 2 US Ecology Site Investigation. (5)

RESPONSE: There are two caissons located between Trenches 3 and 4, and 28 caissons in Trench 11B. The caissons between Trenches 3 and 4 were filled with concrete and capped. The caissons in Trench 11B are still active and are used exclusively to dispose of high-activity casks (IF-300) from nuclear power plants. There is no evidence that liquid waste was disposed in any of the caissons. The Department of Ecology will further investigate the caissons in the 2004 MTCA investigation.

3.3 Transuranic Waste

33. COMMENT: The EIS failed to disclose to the public and agency decision makers that liquid and transuranic wastes were disposed in the site, and that the presence of liquids could increase the migration of contaminants. (29)

RESPONSE: A discussion on transuranic (TRU) wastes and liquid wastes was added to Section 2.3, Waste, in the Final EIS.

34. COMMENT: The 1985 US Ecology Site Environmental Review documents that by 1980, the site had received over 80 pounds of TRU waste that was predominantly plutonium (page 2-40). This source term is not discussed in the EIS and it is not considered in the modeling and risk assessment. Because TRU was released at this site, the site should be closed as a TRU waste site, not as a low-level waste site, or the TRU must be dug up and removed from the site. In addition, NRC regulations for TRU waste must be applied to this waste site. (5)

RESPONSE: TRU waste has been disposed at the commercial LLRW site in compliance with U.S. Nuclear Regulatory Commission (NRC) and DOH

regulations. All waste, including TRU waste, was considered in the source term used for the Radiological Risk Assessment (Appendix II).

3.4 Hazardous Waste

35. COMMENT: In 1985, a letter from the Department of Ecology to US Ecology Inc. (Ecology, 1985) designated the resin tanks as extremely hazardous waste and required US Ecology to perform some drilling and sampling in an effort to characterize the nature and extent of contamination released from the tanks. That characterization was never completed and the phase I and phase 2 US Ecology Site Investigation just completed did not address this contamination. Before the EIS is approved and the proposed actions take place, the contamination released from the resin tanks must be characterized, and the distribution of that contamination in the vadose zone must be determined. Currently, there is not even an explanation of the chemicals and the chemistry of the resin that was released to the tanks. (5)

    RESPONSE: The Final EIS includes a discussion of the tanks in Section 2.3.1.3, Liquid Waste. The 2004 MTCA investigation will further investigate contamination from the resin tanks.

36. COMMENT: There is long standing evidence that US Ecology managed hazardous wastes in a manner that violated state laws. This information is omitted from the EIS. The EIS fails to discuss past practices at the site and hazardous waste manifests that would lead a reasonable person to conclude there are buried leaking containers of hazardous waste that are contributing to site contamination. A 1985 site assessment conducted by EPA and the Department of Ecology noted that this site continues to receive RCRA and state dangerous wastes. The site inspection resulted in 14 violations, including failure to identify wastes, failure to use the waste manifest system, and failure to comply with performance standards for the site that required the new trenches to be lined with a leachate collection system. Fifteen years have passed and the site still has not lined its trenches. (22)

    RESPONSE: The Final EIS states that an estimated 17,000 cubic feet of unauthorized non-radioactive hazardous wastes were disposed at the commercial LLRW site between November 1965 and June 1970. These wastes were disposed in the Chemical Trench located in the north-central portion of the site. Documented sources of waste in the Chemical Trench include nine drums of beryllium/copper solid metal shavings, 56 drums of unknown waste, and several thousand drums of phenolic waste. The Chemical Trench was approximately 80% full when it was closed.

    Up until October 28, 1985, the license authorized small amounts of hazardous waste in scintillation fluids to be disposed in Trenches 1 through 10, 11A, and 13. This waste was a component of radioactive waste (mixed waste) and was from

research labs, hospitals, and power plants. The chemicals in the scintillation fluids included toluene, benzene, and xylene. Disposal of these wastes ended in 1985. Please see Section 2.3.4, Non-Radioactive Hazardous Waste.

The commercial LLRW site has not accepted mixed waste since 1985 and will not accept mixed waste in the future under any licensing alternative.

In response to your comment on liners, the Renew License Alternative includes secondary containment for all Class B and C waste, and selected Class A waste. Please see Section 1.3, Areas of Controversy, Disposal of Waste into Unlined Trenches, for more discussion on secondary containment at the commercial LLRW site.

37. COMMENT: The DEIS reveals that the US Ecology site improperly accepted and buried hazardous wastes. (70) (60)

RESPONSE: Please see the response to Comment #36.

38. COMMENT: It's as if the hazardous wastes were swept under the rug. We need to investigate and clean them up, and closure alternatives essentially ignore that. (29)

RESPONSE: Several of the cover alternatives, including the preferred alternative, are compliant with RCRA (Resource Conservation and Recovery Act). The nature and extent of contamination of non-radionuclides will be further investigated in the 2004 MTCA investigation. The preferred cover construction schedule alternative will build the final cover in phases so that results from the 2004 MTCA investigation can be incorporated into the final cover design.

39. COMMENT: The EIS ignores relevant data available from the Site Investigation (i.e., the presence of freon in older trenches), site manifests, site photos, or previous site investigations that suggest that the site itself is contributing to the chemical contamination found. Truck shipment records kept by US Ecology indicated that from 1965 to 1970, the Chemical Trench was used to dump "waste phenol", "drums of chemical waste, and "phenolic resin wastes." These data sources indicate that the hazardous wastes buried at the site are not inconsequential and exceed the EIS estimate that 17,000 cubic feet of wastes were buried at the site from 1965-1970. Are additional disposal records available to the departments of Ecology and Health? Did they make such a request to US Ecology as part of the preparation for this EIS? Did they review past site assessments that they had conducted? Why not? (22)

RESPONSE: In 1984, US Ecology provided information to DOH on waste in the Chemical Trench. DOH also received information regarding the Chemical Trench on July 2, 1990, as part of a historical report. US Ecology provided additional information on September 30, 1993. The facility operator searched

company records, contacted former employees of California Nuclear and NECO, and contacted the generators on record. Records that were recovered indicate that waste phenol, phenolic resin wastes, beryllium copper shavings, and cycloheximide chemical wastes were disposed in the Chemical Trench.

40. COMMENT: The EIS failed to disclose "a long list of violations of our dangerous waste regulations" by the site operator and the potential for those conditions, including improper disposal of wastes and disposal of hazardous wastes that are barred from land disposal, to increase the release rates of contaminants and increase health and environmental risks. (29)

RESPONSE: The state is unaware of the "long list of violations of our dangerous waste regulations" the commenter refers to. Release rates of non-radioactive contaminants and the impact on public health and the environment will be further defined during the 2004 MTCA Investigation.

4.0 REGULATIONS, LEGISLATION, POLICY

4.1 General Comments

41. COMMENT: This reviewer is not an expert on the various environmental regulations, but this EIS appears to have circumvented many regulations in an attempt to re-license the Disposal Facility. The two State agencies that prepared this EIS are the very organizations that are responsible for enforcing environmental regulations elsewhere at Hanford and throughout the state. It seems prudent that those agencies should adopt for themselves, the most strict interpretation of the regulations that they are responsible for enforcing. Instead, it appears they are attempting to sidestep MTCA, they are ignoring NRC regulations by ignoring the TRU waste, and they are ignoring corrective action requirements of WAC 173-303 for identification of groundwater contamination sources. If these agencies do not adopt the regulations for themselves, how can they enforce those regulations at Hanford or elsewhere? Further, there appears to be a conflict of interest for this facility when the organization responsible for licensing the facility is the proponent for and author of an EIS for the facility. Who is regulating and overseeing the operation of this facility? (5)

RESPONSE: Although both agencies are authoring the EIS, neither agency is a proponent for any of the alternatives. The agencies are evaluating all alternatives and disclosing projected impacts based on available information. Senior management at both agencies will be responsible for evaluating those impacts and making future decisions pertaining to the commercial LLRW site.

DOH has the lead responsibility for enforcing the regulations that pertain to radionuclides, and the Department of Ecology has the lead for enforcing regulations that pertain to non-radioactive hazardous wastes. MTCA is being applied to non-radioactive hazardous wastes at the commercial LLRW site.

Corrective action requirements under Chapter173-303 WAC will be determined through MTCA. Disposal of TRU waste has been and continues to be in full compliance with federal and state regulations.

42. COMMENT: Establish a firm policy and include in the site license provisions that bar the use of the commercial LLRW dump for USDOE generated wastes, foreign wastes, and air-transported wastes. (29)

RESPONSE: The Northwest Compact can legally exclude LLRW from states outside the Northwest Compact, but it does not have exclusionary authority over NARM. The one shipment of foreign waste received during the summer of 2000 was NARM. Please see the response to Comment #75 for the state's approach to USDOE wastes.

43. COMMENT: The EIS should consider how we could reduce regulations and costs associated with disposing of some of these wastes. (25)

RESPONSE: The department's regulations for the disposal site have been previously reviewed under the Regulatory Reform Act of 1995.

44. COMMENT: The commercial LLRW disposal site has coasted outside the standards for monitoring and leachate control that apply to similar sites at Hanford. (19)

RESPONSE: The commercial LLRW site has operated, and if relicensed will continue to operate, under the authority of Chapter 246-249 and 246-250. The site is in compliance with these regulations.

45. COMMENT: The EIS ignores the fact that Initiative 383's policy on importing more radioactive waste to Washington State is still law. The EIS does not disclose nor consider the impacts of changing the State policy that discourages radioactive waste imports, allows use of the commercial Low-Level Waste Dump for only Compact generated Low-Level Wastes, and limits radioactive wastes imported and disposed in Washington. (29)

RESPONSE: The Washington State "policy" on the importing of radioactive waste is based on the equitable distribution and shared responsibility for the burden of low-level radioactive waste disposal. The "policy" is not a written, formal policy, but rather is formed by past state actions. This informal policy is discussed in Section 2.2.5, Washington State Policy on Importation of Radioactive Waste, in the Final EIS.

46. COMMENT: DEIS Page 125 – Under Benefits to the State of Washington, the first sentence states that the Department of Ecology has landlord oversight responsibility. However, page 42 lists the U.S. Department of Energy as the landlord. This is inconsistent. (10)

RESPONSE: USDOE is the landowner and has a lease with the state of Washington. The state of Washington has a sub-lease with US Ecology. This has been clarified in Section 2.2, Legal, Regulatory, and Policy Considerations.

47. COMMENT: The EIS fails to consider replacing US Ecology, Inc, with a more responsible company. (29) (43)

RESPONSE: The EIS is not the appropriate vehicle for evaluating the site operator. The standards proposed within the Final EIS are universal and will apply to whoever is operating the commercial LLRW site.

48. COMMENT: Compete the site sublease with consideration of the applicants' environmental records and financial capabilities, and include consideration of the lease expiration in the EIS, along with the license restrictions recommended above. (29)

RESPONSE: The sublease is an administrative component of continued site operation and not a subject of the EIS. Following a public hearing, the state will evaluate the elements of the sublease during negotiations beginning in 2004.

49. COMMENT: Information about the lease is misleading and must be corrected. The EIS describes the lease between DOE and the State but it must address the sublease between the State and US Ecology. The sublease between US Ecology and the State expires at midnight on July 28, 2005. Pursuant to RCW 43.200.080, a public hearing is required. The EIS should state the parameters of the upcoming lease renewal, define the lease clauses that will be up for discussion, incorporate renewal decisions into the alternatives presented by the drafted EIS, add a copy of the state's lease to US Ecology. (22)

RESPONSE: Please see the response to Comment #48.

50. COMMENT: Given that the Pollution Control Hearings Board is scheduled to hear US Ecology's appeal of the corrective action requirements on January 24, 2001, the results of their hearing should be incorporated into the final EIS. (22)

RESPONSE: Information on the Hanford Site Permit is included in Section 2.2.3, Instruments and Agreements, in the Final EIS.

51. COMMENT: Modify Table 6 and associated discussions to recognize that US Ecology is currently out of compliance with state laws, subject to corrective action requirements, and that US Ecology has appealed the RCRA permit conditions that would require them to fulfill corrective action requirements in accordance with RCRA. (22)

RESPONSE: The following information has been included in Section 2.2.3 of the Final EIS: "The RCRA permit for the Hanford Site (WA7 89000 8967) is issued to USDOE, Fluor Daniel Hanford, Inc., CH2M Hill Hanford Group, Inc., Bechtel Hanford, Inc., and the Pacific Northwest National Laboratory. The permit is applicable to the entire Hanford Site, including the commercial LLRW site. Solid waste management units located at the commercial LLRW site and subject to the permit include: (1) the Chemical Trench; (2) Trenches 1 through 11A; and (3) an underground resin tank. The permit requires the Department of Ecology to make a decision on whether additional corrective action is necessary at these units. US Ecology has objected to inclusion of the commercial LLRW site in the Hanford Site Permit. In June 2003, a permit modification was made to extend the schedule for the Department of Ecology to make a decision on whether or not additional corrective action will be required at the commercial LLRW site. This decision won't be made until completion of the MTCA investigation."

52. COMMENT: Washington State Law requires that the facility investigation and the EIS be conducted under the direction of a Washington State licensed Professional Engineer and that that engineer must approve the work.

Chapter 18.43 RCW defines the practice of engineering as:

"…any professional service or creative work requiring engineering education, training and experience and the application of special knowledge of the mathematical, physical and engineering sciences to such professional services or creative work as consultation, *investigation* ...in connection with any public or private utilities, structures, buildings, machines, equipment, processes, works or projects." (Emphasis added).

General provisions require: "In order to safeguard life, health, and property, and to promote the public welfare, any person in either public or private capacity practicing or offering to practice engineering ... shall be registered as hereinafter provided..."

Under these regulations, the investigation of the low-level burial ground is defined as engineering work and employees of State agencies who practice engineering are specifically required to be licensed. The point of these regulations is to protect the health and safety of the public. In the case of this EIS, this reviewer does not believe the health and safety of the public is protected and perhaps part of the reason it is not is because these State agencies violated this RCW by not having this work completed under the direction and review of a qualified and licensed Professional Engineer. As a result, this EIS should be withdrawn. (5) (22)

RESPONSE: The Washington State Board of Registration for Professional Engineers and Land Surveyors was asked a similar question during the course of an investigation in 1998 (No. 97-11-0006). The Board responded that, "All DOH

agency and division personnel share a responsibility to assure that all engineering design plans and specifications submitted and reviewed are prepared by qualified licensed professional engineers licensed in the state of Washington." The department employed two qualified and licensed engineers to review the relevant design plans and specifications, and also relied on US Ecology to use licensed engineers in the preparation of their closure cover design.

In accordance with SEPA regulations, the department employed staff qualified in all of the required areas (hydrogeology, geochemistry, health physics, computer modeling, etc.), as well as the two licensed professional engineers. WAC 197-11-420 (SEPA rules on EIS preparation) states, "Preparation of the EIS is the responsibility of the lead agency, by or under the direction of its responsible official, as specified by the lead agency's procedures. The responsible official, prior to distributing an EIS, shall be satisfied that it complies with these rules and the procedures of the lead agency." SEPA regulations also state, "The lead agency may have an EIS prepared by agency staff, an applicant or its agent, or by an outside consultant retained by either an applicant or the lead agency. The lead agency shall assure that the EIS is prepared in a professional manner and with appropriate interdisciplinary methodology. The responsible official shall direct the areas of research and examination to be undertaken as a result of the scoping process, as well as the organization of the resulting document."

4.2 Applicability of MTCA

53. COMMENT: The EIS fails to discuss the environmental benefits from, and legal applicability of, the closure standards for dangerous waste landfills in Washington's Dangerous Waste law (RCW chapter 70.105) and regulations. Instead the EIS cites only DOH requirements, yet, Ecology has formally recognized that the dumpsite is a dangerous waste landfill. (29)

RESPONSE: Section 2.2, Legal, Regulatory, and Policy Considerations, discusses laws and regulations relevant to radionuclides and to hazardous waste. For closure, the state has determined that radionuclides will be subject to Chapter 246-250 WAC, and non-radionuclides will be subject to MTCA (Chapter 173-340 WAC).

54. COMMENT: How can the State approve allowing health risk that exceeds MTCA limits? (38)

RESPONSE: MTCA will be applied to the commercial LLRW site for non-radioactive substances. Although MTCA addresses radionuclides within its definition of "hazardous substances," a number of considerations affect the application of MTCA to the cleanup of radionuclides. There are legal questions concerning the application of MTCA to address those radionuclides regulated by the federal Atomic Energy Act of 1954 (AEA) (i.e., source, special nuclear, and

byproduct materials as defined by the AEA). Federal courts have held that the AEA preempts state regulation of the radiation hazards of such materials, which may preclude the application of MTCA to remediate radiation risks. While the Department of Ecology does not concede any authority granted through MTCA, in light of these decisions, the Department of Ecology will focus its regulation under MTCA where its authority is clearest. Therefore, at this time, the Department of Ecology does not intend to regulate the radiation hazards of AEA-regulated radionuclides.

With respect to the non-radiological hazards of AEA regulated radionuclides, as well as any hazards posed by other non-AEA regulated radionuclides, the Department of Ecology may apply MTCA if data indicate releases of AEA regulated radionuclides that pose a non-radiological hazard, or releases of any non-AEA regulated radionuclides. Please see Section 2.2.2, Regulations, in the Final EIS.

55. COMMENT: The discretion allowed in MTCA can be applied if Ecology determines “that another law is more appropriate.” It is unclear what other law Ecology has determined is more appropriate than MTCA. (22)

RESPONSE: Please see the response to Comment #53.

56. COMMENT: The EIS improperly states that MTCA is not applicable in the chart at Page 46, and calls it a "consideration value" only. The EIS then fails to show any consideration of reasonable alternatives to meet MOTCA standards. In any event, MOTCA is applicable, pursuant to the requirement for a field investigation under RCRA, pursuant to the Hanford Site Part B RCRA permit, and due to the finding that groundwater has been contaminated from releases at levels exceeding MOTCA Method B standards. The license must specify that MOTCA is applicable, and that the licensee must comply with the investigation and cleanup requirements of MOTCA and RCRA, and must operate the site in a fashion that it does not cause future violation of MOTCA standards, creating a future liability and remedial action requirement. (29)

RESPONSE: The Final EIS has been revised to clarify that MTCA is being applied to non-radioactive hazardous wastes at the commercial LLRW site.

57. COMMENT: MTCA must be applied to the site and discussed in the alternatives. The EIS must openly discuss Ecology’s basis for not applying MTCA at this time, and the criteria and process that Ecology will use to decide if and when to apply MTCA. (22)

RESPONSE: MTCA is applicable at the commercial LLRW site and will be used for the remediation of non-radioactive hazardous substances. MTCA is not a factor in evaluating the License Renewal nor the Diffuse NARM Alternatives because these actions do not affect the remediation of hazardous waste.

58. COMMENT: MTCA cannot be violated by the operation of this dumpsite. That means limiting the amount of waste further, limiting the total quantity of waste, the source term. It means changing operational requirements and it means changing the closure requirements including the cover. (29)

RESPONSE: The US Ecology license does not allow the disposal of non-radioactive hazardous substances, and therefore MTCA does not affect the evaluation of the license alternatives in the EIS.

The preferred cover design and cover construction schedule alternatives both address non-radioactive hazardous substances. The GeoSynthetic Cover was identified as the preferred cover design, in part, because it was determined to be RCRA-compliant. The Close-As-You-Go Schedule constructs the final cover in three phases to allow the results of the 2004 MTCA investigation to be considered prior to final construction.

59. COMMENT: Ecology's delegation of authority to DOH appears to conflict with the 1994 MOU. The 1994 MOU explicitly defines Ecology as the lead agency at sites where there are both radioactive and nonradioactive materials. Given this MOU and RCW 70.105, it is unclear how Ecology used its discretion under MTCA to recognize DOH as the overall lead agency for the cleanup and closure of the site. (22)

RESPONSE: The commercial LLRW site is licensed and regulated under the authority of Chapter 70.98 RCW and the Department of Health. The 1994 MOU (Memorandum of Understanding) provides that "At sites containing both nonradioactive hazardous chemicals and radioactive material, separately or in combination, Ecology and Health shall share regulatory responsibility." WAC 173-340-110(2) reads, "The department may initiate a remedial action under this chapter and may upon further analysis determine that another law is more appropriate, or vice versa." Please also see the response to Comment #54.

60. COMMENT: Modify Table 6 and associated discussions to state that the US Ecology site is on the Toxics Cleanup Program's list to get a site hazardous assessment under MTCA. Public records indicate that technical staff has stated that if this site were given a site hazard assessment, it would likely receive the maximum score due to its past history and the fact there is no liner, no cover and no leachate containment. If the intent was for the US Ecology site Investigation to serve as the MTCA site assessment, then this should be clearly stated in the EIS along with a clear discussion of the Site Investigation vs. the parameters of a MTCA site assessment. (22)

RESPONSE: In January 2001, Ecology conducted a site hazard assessment of the commercial LLRW site according to Chapter 173-340-320 WAC. The site's hazard ranking, an estimation of the potential threat to human health and the

environment relative to all other Washington State sites, was determined to be a "5," where "1" represents the highest relative risk, and "5" the lowest. The site was listed on the state's Hazardous Sites List in February 2001. A MTCA Investigation is planned for 2004. This information has been included in Section 2.4.2.1, MTCA Remedial Investigation and Feasibility Study, in the Final EIS.

4.3 Dose Limits and Risk Levels

61. COMMENT: EPA has determined that the standards relied on in the Draft EIS (Chapter 246-250 WAC and Chapter 246-246 WAC) are NOT PROTECTIVE of human health and the environment for sites with releases of radionuclides. The only reason that the US Ecology site is not part of the Hanford CERCLA National Priorities List site is that the investigation to determine if there was a release had not yet occurred at the time of the 1989 listing of the remainder of the Hanford Site. The RCRA investigation begun by EPA in 1992 was delegated to the State, based on Washington utilizing the corrective action authority and standards in RCW 70.105 and 70.105D and WAC chapter 173-343. Ecology may not substitute standards to apply at the site of a release, when EPA has determined that the dose limits established in this rule as promulgated generally will not provide a protective basis for establishing preliminary remediation goals (PRGs) under CERCLA.

The NRC rule set an allowable cleanup level of 25 millirem per year (equivalent to approximately 5 x 10-4 increased lifetime risk) as the primary standard with exemptions allowing dose limits of up to 100 millirem per year (equivalent to approximately 2 x 10-3 increased lifetime risk)... cleanups at these sites will typically have to be more stringent than required by NRC dose limits in order to meet the CERCLA and NCP requirement to be protective. Thus, the State DOH standards - which are based upon the NRC standard, referred to in the EPA determination - relied upon are not protective of human health and the environment for cleanup of releases involving radionuclides, as determined by EPA.

The same standard for corrective action under RCRA would apply. Even if it were not legally "applicable" because of the lack of a current release, *it would violate the State agencies' trust responsibilities under MOTCA and SEPA (regarding the individual's right to a healthful environment) for State agencies to use a standard that is not protective of human health for determining the adequacy of closure and remedial actions (i.e., leachate collection, monitoring, etc.) at the landfill, knowing that future releases would result in violation of MOTCA 's cancer risk standards for future generations.* <u>In any event, the failure to consider in the EIS, as a reasonable alternative, imposing conditions and limits to meet the CERCLA or MOTCA standards violates SEPA.</u> (29)

RESPONSE: The MTCA risk standards will be applied to the non-radioactive hazardous substances, and Chapter 246-250 WAC will be applied to the radioactive substances at the commercial LLRW site. The state believes the use

of these regulations at the commercial site is in compliance with the State Environmental Policy Act (SEPA). Please also see the response to Comment #54.

The lack of conclusive evidence of the effect of low-level radiation has contributed to disagreements between EPA and NRC on setting dose limits (GAO 2000). Although EPA (1999) states that NRC requirements (NRC 1997) are generally not applicable to CERCLA cleanup sites, a recent National Research Council report (NAS 1999) concluded that the apparent discrepancy between EPA and NRC is more a matter of policy than science. These policy issues contribute to the inconsistency in various regulations, including differences in statutory mandates, applicability of standards, population groups of concern, and the choice of natural background levels used to set standards. However, the differences among these various regulations do not necessarily signify inconsistency in acceptable public health risk (NAS 1999).

The debate over standards not withstanding, hypothetical impacts from the commercial LLRW site are best presented in the context of the surrounding 586-square mile Hanford Site. The commercial site is a 100-acre site in the middle of the much larger contaminated central plateau area of Hanford. USDOE has designated the central plateau for Industrial-Exclusive use in the final Hanford comprehensive Land Use Plan (CLUP) EIS (USDOE 1999). It is likely that waste management activities, other than the commercial site, would make the entire central plateau unfit for residential use or other long-term uses for an indefinite period. In this context, hypothetical impacts from the commercial site would contribute little, if any, to the overall impact on public health. USDOE is planning to use institutional controls to restrict public access to the central plateau for the foreseeable future. It will be every future generation's responsibility to ensure that these controls remain in place for as long as necessary.

62. COMMENT: State law says we have to clean up hazardous waste dumps to a risk level of one additional cancer for every 100,000 people. Every single one of the alternatives exceeds our state hazardous waste law by at least 23 times – even without an intrusion. The US Ecology Cover is 44 times. At best, if you shut the site this year and use an enhanced cover, you still have a risk level of 23 times greater than MTCA. The EIS needs to redo the cover designs. (29)

RESPONSE: The preferred cover design alternative is a "state-of-the-art" cover that meets both RCRA and NRC design requirements for closing hazardous and radioactive waste sites. Even so, hypothetical risk for radionuclide levels that are in compliance with the annual 25 millirem standard, is generally greater than the one in 100,000 risk level allowed at hazardous waste sites.

63. COMMENT: The EIS uses the NRC standard of 25-millirem per year offsite and 100 to 500-millirem per year onsite. In 1997, USEPA said these dose limits are not protective under the federal superfund law. (29)

RESPONSE: The state has determined that 25 millirem per year is the appropriate regulatory offsite dose limit. The state has also selected 100 millirem per year as a guidance value for the onsite dose. The 25/100 millirem per year dose values are reinforced with the ALARA (as low as reasonably achievable) principle. With the consistent application of the ALARA principal, the state considers the 25 millirem per year standard and the EPA 15 millirem per year guidance value to be equally protective of human health.

64. COMMENT: The DOH standards regarding risk exposure to radioactive waste is out of compliance with standards recommended by EPA as defined in the December 1999 guidance on Radiation Risk Assessment at CERCLA sites. (22)

RESPONSE: Please see the response to Comment #61.

65. COMMENT: The EIS clearly demonstrates that the site right now poses an unacceptable health risk to future generations. The EIS proposes a plan that will allow one location at Hanford to leach and expose the public to a much higher level of risk than the other areas that we're cleaning up at Hanford. The EIS allows a 25 millirem per year dose and everything else at Hanford is being cleaned up to a total combined dose that does not exceed 15 millirem per year. So why should we not limit this site to 15 millirem per year? (29)

RESPONSE: The 15 millirem Hanford cleanup level and the 25-millirem standard cannot be directly compared. The 15 millirem per year level currently applied to Hanford is an interim standard and does not include the groundwater pathway. The predicted offsite resident dose from the commercial LLRW site would be significantly less than 15 millirem per year if groundwater were not considered.

66. COMMENT: All alternatives presented must meet the 15-millirem per year cleanup guidance from EPA. As drafted, only the enhanced asphalt cover and the enhanced bentonite cover comply with this standard. (22)

RESPONSE: Alternatives in the EIS were presented to show a range of impacts. The state is using the 25 millirem per year NRC and DOH standard (plus ALARA) as the regulatory level that the final cover design must meet. All cover designs, except the Site Soils Cover, meet this standard.

67. COMMENT: The quantification of dose to the on-site intruder expands the intent of 10 CFR Part 61 (and Washington Administrative Code) as it relates to inadvertent intruder protection. NRC used the concept of the inadvertent intruder to require specific administrative controls to further isolate the most hazardous and long lived waste class. In its final rulemaking, NRC rejected any quantification of dose associated with a hypothetical intruder. Instead, NRC required (as does DOH) prescriptive administrative controls to minimize both

opportunities for, and consequences of inadvertent intrusion absent institutional controls. Hypothetical doses to hypothetical intruders are not relevant to quantitative evaluation of site performance because of the long time frames, and conservative assumptions about site performance and speculated human activities in the distant future. (15)

RESPONSE: The department is aware of the NRC position concerning an intruder dose value. A 100 millirem per year guidance value for the onsite intruder was selected for the Final EIS. This value is lower than the 500 millirem per year that was cited in the Draft EIS. The 100-millirem guidance value was determined to be a more appropriate value and is based primarily on NCRP Report No. 116, *Limitation of Exposure to Ionizing Radiation*.

68. COMMENT: The EIS fails to include the risk of institutional controls failing, and calculating that as part of the total allowable cancer risk. The Department of Ecology, under MTCA, says that you have to consider the likelihood of institutional controls being breached, and you still can't exceed 1 in 100,000 total risk. The EIS has closure alternatives ranging upwards to 500 millirem per year. US Ecology's proposed cover is 780 times higher than the MTCA standard. That is 7.8 fatal cancers for every 1000 children exposed to the site. (29)

RESPONSE: The onsite intruder exposure scenarios include resident and trespass scenarios. Failure of institutional controls is inherent in these scenarios. The trespass scenario was added to be consistent with the approach taken at MTCA sites. The dose predicted for the intruder upland hunter is significantly less than the predicted intruder resident dose. This difference in dose confirms the importance of maintaining effective USDOE and state institutional controls.

69. COMMENT: The EIS must fully consider meeting MTCA's health based risk standard, including use of MTCA's maximum reasonable exposure scenario requirements for loss of institutional controls. The EIS must consider the cumulative risks from the other sources on the Hanford site to the exposed population. From the US Ecology site alone, offsite risks to the Native American exposed population (with no failure of institutional controls) exceed MTCA standards for cancer risk by 44 times (for the US Ecology proposed cover and without increasing NARM wastes). <u>The risk to the Native American population exercising Treaty rights to live on, etc... ceded lands creates a liability for Washington State if the site closure plan and license are not changed to prevent exposure in excess of MTCA standards</u>. This is also the minimally protective action that our state should take as a matter of principle. (29)

RESPONSE: MTCA standards will be applied to non-radioactive substances and Chapter 249-250 will be applied to radioactive substances. The loss of institutional controls in the Final EIS <u>is</u> addressed through the Trespass and Resident Intruder Scenarios. This approach to intruders is consistent with the

current approach used under MTCA at hazardous waste sites. Please see Response to Comment #54 for a discussion of the applicability of MTCA.

70. COMMENT: Pg 94. It is ill-advised to talk about exceeding certain values and then noting that they really do not apply. That is unnecessarily alarming. It also implies that the US Ecology Site will not be cleaned up to the same standards as the federal lands at Hanford. This needs to be explained. (10)

RESPONSE: The reference to the Radiation Cleanup Standards as a guidance value has been removed from the Final EIS. Commercial LLRW disposal sites are specifically exempt from these standards.

71. COMMENT: Past discussions requesting a MTCA analysis were ignored. A year ago Ecology requested DOH to evaluate a modified MTCA Method B residential scenario and a modified MTCA Method C industrial scenario. The memo stated this was needed in order to assess exposure risk from hazardous substances at the site. (22)

RESPONSE: The September 2, 1999 letter to Nancy Darling, DOH, from Phil Staats, Department of Ecology, specifically requested that a modified MTCA method B and modified MTCA method C be performed for radionuclides. In response to this request, Chapter 7 of Appendix II of the Draft EIS included a MTCA analysis for radionuclides. The Department of Ecology has determined that cleanup of radioactive substances will be done Chapter 249-25 WAC, not under MTCA. Due to this determination, the MTCA analysis was not carried forward in the Radiological Risk Assessment (Appendix II) completed for the Final EIS.

72. COMMENT: The entire EIS totally fails to consider the cancer risks from non-radioactive, chemical wastes leaking from the dumpsite. Both SEPA and MOTCA require consideration. MOTCA requires that the cleanup (and therefore, the state must design closure to meet this standard) levels be based on the cumulative cancer risk from both radionuclides and other hazardous substances. (29)

RESPONSE: Summation of radionuclide and chemical cancer risks is technically questionable due to differences in methods used for calculating risk (EPA 1989, 1996, 1999). However, decisions on how and when to close the commercial LLRW site have and will fully consider risks associated with non-radioactive hazardous wastes.

73. COMMENT: Please explain the application of the DOH Guidance for Radiological Cleanup in Table 6. The wording appears to indicate that the State intends to hold itself to a less stringent cleanup standard than the State expects DOE and other parties to meet. (10)

RESPONSE: The DOH Interim Hanford Guidance for Radiological Cleanup states, “For facilities regulated by a state or federal regulation containing an applicable health-based cleanup or closure standard specific for radionuclides, DOH may upon further analysis determine that standard to be more appropriate.” For closure of the commercial LLRW site, DOH has determined that Chapter 246-250 WAC is a more appropriate standard than the DOH interim guidance. Chapter 246-250 WAC is a federally and state adopted standard specific to commercial LLRW sites. This standard underwent a much more rigorous review than the interim guidance.

74. COMMENT: The local gas station is only allowed 1 in 100,000 cancer fatalities, but in your best scenario there would be two fatal cancers per thousand persons. This is unacceptable and also illegal. (79)

RESPONSE: The preferred alternative is predicted to meet the dose requirements for radionuclides. Regulatory dose levels for radionuclides have been subject to a rigorous international and national review and determined to be safe for public health. When methodologies used to determine risk for hazardous substances are applied to these regulatory dose levels, the results are hypothetical risk levels higher than those that are acceptable for hazardous substances.

4.4 USDOE Waste

75. COMMENT: The disposal of USDOE wastes would reverse publicly stated policy of Washington State, and open the door to the state becoming liable for releases of USDOE wastes from the dumpsite, as well as opening the door to USDOE sending waste from other USDOE facilities. USDOE refuses to honor its prior commitment to subject its radioactive waste generating processes to NRC or NRC delegated state regulation. Thus, the USDOE wastes would be the only non-regulated generator wastes disposed at US Ecology, while USDOE records provided to Washington State by Heart of America Northwest and Heart of America Northwest Research Center acknowledge repeated failure of USDOE generators to properly characterize and segregate dangerous wastes from low-level wastes.

Establish a firm policy and include in the site’s license provisions that bar the use of the commercial LLRW dump for USDOE generated wastes. Allowing the disposal of USDOE wastes at the commercial LLRW disposal site violates longstanding state policies. Longstanding policies state that if we can’t regulate the generator of radioactive wastes (such as USDOE), then you can’t dispose of waste at the site. USDOE has a horrendous record of violating hazardous wastes laws and has admitted disposing of hazardous waste into their own low-level radioactive waste burial grounds. (29)

RESPONSE: There is no policy prohibiting the disposal of USDOE wastes at the commercial LLRW site. Washington State has allowed disposal of USDOE wastes in the commercial LLRW site under certain conditions, including: USDOE meets all license requirements, and USDOE pays the same fees as other site users. Historically, only a few small quantities of waste have been received from offsite USDOE facilities.

76. COMMENT: It is well documented that USDOE waste acceptance criteria for DOE wastes is entirely inadequate. USDOE has sent numerous illegal shipments of hazardous waste to the low level burial grounds at Hanford. This long history of mismanagement of hazardous wastes has to be taken into consideration before moving forward with the DEIS. Allowing disposal of these improperly packaged, improperly transported, and improperly disposed wastes will add to the existing threat of hazardous constituents at the site. (59)

RESPONSE: The commercial LLRW site does not allow disposal of hazardous wastes. USDOE LLRW accepted at the commercial LLRW site have been and will be required to meet all license and waste acceptance criteria that other generators are required to meet.

77. COMMENT: The DEIS fails to confirm the state's policy to not accept US DOE wastes, including FFTF reactor and plutonium processing waste in shipments from other USDOE weapon sites and labs. It also fails to consider the types and effects of these wastes in future scenarios. (19)

RESPONSE: Please see the response to Comment #75.

78. COMMENT: The state should firmly oppose disposal of USDOE wastes at the commercial dumpsite. (69)

RESPONSE: Please see the response to Comment #75.

79. COMMENT: The state must respect its own policy that prohibits USDOE waste disposal at Hanford. Governor Locke should take the lead in informing USDOE that Washington will not allow implementation of the plan to open Hanford to increased radioactive waste disposal. (69)

RESPONSE: Please see the response to Comment #75.

80. COMMENT: Allowing the disposal of USDOE wastes at the commercial LLRW disposal site is tantamount to the State assisting the USDOE in reopening the FFTF reactor. (29)

RESPONSE: USDOE has decided to not restart the FFTF. Please see the response to Comment #75.

81. COMMENT: I am against the disposal of any waste that is produced by FFTF. (73) (40) (79) (74) (49) (43) (38) (37) (70) (69)

RESPONSE: Disposal of FFTF waste is not an issue for the commercial LLRW site. USDOE has decided to not restart FFTF.

82. COMMENT: The DEIS does not prohibit disposing of FFTF waste, despite the fact that disposal of such wastes would violate existing USDOE and Washington state policies. (77) (60)

RESPONSE: Please see the responses to Comments #81 and #75.

83. COMMENT: Keep USDOE wastes out of Hanford, with the attendant transportation problems. Most importantly do not aid the restart of FFTF. I believe the University of Washington faculty who say there is no need for isotopes from Hanford. (67)

RESPONSE: Please see the response to Comment #81.

84. COMMENT: How come we are rehashing FFTF when, at previous meetings, persons protesting the restart of FFTF gave reasons not to restart, based on the health of the Columbia River and the health of the people in both Oregon and Washington? (66)

RESPONSE: Please see the response to Comment #81.

85. COMMENT: The EIS should address that the U.S. Department of Energy, in a cynical public relations effort, has formally proposed to dump wastes from the restart of Hanford's FFTF Nuclear Reactor and related Plutonium and isotope processing activities into the commercial Low-Level Radioactive Waste Dump, in order to avoid charges that the restart added to the Hanford Environmental Management Program's waste disposal burdens – a move that would violate prior statements of state policy adopted to protect against serious environmental impacts from disposing of USDOE wastes at the commercial dump, and state policy to avoid becoming a liable party for the cleanup of USDOE wastes pursuant to CERCLA for allowing USDOE wastes to be dumped into a state leased, state permitted landfill. Note: the State has in the past expressed concern that the USDOE has reneged on prior commitments to subject its waste generating nuclear operations to NRC or state delegated regulation. USDOE's wastes would be the only non-regulated generator wastes disposed at the commercial site; and, Ecology and Health are aware that internal USDOE records reveal a pattern of USDOE generators failing to meet waste acceptance criteria and Washington requirements for designation, characterization, segregation and tracking of dangerous wastes (these records have been made available to Ecology by Heart of America Northwest Research Center). (29)

RESPONSE: Please see the responses to Comments #75 and #81.

86. COMMENT: The EIS failed to disclose and consider the impacts of the USDOE proposal to begin disposal of wastes from its FFTF Reactor and Plutonium and isotope processing operations at the US Ecology Low-Level Waste Site, and that this related action (requiring state approval via the Northwest Interstate Compact and permitting and license decisions) has significant environmental impacts, including the addition of new types of wastes, which are not considered at all in this EIS. Rather, the focus sheet and other agency statements in this process improperly say that the state will consider USDOE's proposal in other contexts - for which there is no public participation and no anticipated EIS. (29)

RESPONSE: Hypothetical future impacts were predicted using a generic waste stream that is based on past waste disposal and known future waste disposal. The important factor in predicting impacts is the waste stream characteristics, not the specific generator.

87. COMMENT: The disposal of FFTF waste is a separate issue from this EIS. The opposition is clearly using their dislike of anything FFTF to attempt to frustrate the legitimate disposal of NARM waste. (45)

RESPONSE: Please see the response to Comment #81.

88. COMMENT: I would encourage the state to explore the potential of disposing of FFTF waste at the commercial LLRW disposal site. (27)

RESPONSE: Please see the response to Comment #81.

4.5 Foreign Waste

89. COMMENT: The EIS failed to disclose that US Ecology imported foreign source NARM waste to the site in 2000, and failed to consider the environmental impacts of the import and disposal of foreign source wastes, including the inability of state regulators to impose generator penalties and inspections on foreign generators, and failed to consider how this violates the state policy that Washington State is only willing to host the site for purposes of doing our state's share of regional waste disposal. (29)

RESPONSE: The Final EIS discusses the disposal of foreign waste in Section 2.3.2.1, Foreign NARM Waste. Also see the responses to Comments #90 and #91.

90. COMMENT: Please address the impacts and risks of import of foreign radioactive wastes, including liability issues. (43)

RESPONSE: Foreign waste is subject to the same waste acceptance criteria as domestic waste and therefore has similar impacts, risks, and liabilities. Waste characteristics are more important for predicting impacts than whether or not the waste is domestic or foreign. The Radiological Risk Assessment (Appendix II) used generic waste streams that were not dependent on whether the generator was foreign or domestic.

91. COMMENT: The EIS must address policy choices when there are clear policy choices to be made, such as whether or not to accept foreign waste. The environmental impacts of accepting or rejecting such waste must be considered. (29)

RESPONSE: The state of Washington would prefer that foreign countries manage their own waste, but neither the federal nor state government has the authority to ban the importation of NARM. However, future foreign NARM shipments are unlikely to occur because US Ecology has voluntarily agreed to not accept or solicit any other NARM shipments from foreign sources. Please see Section 2.3.2.1, Foreign NARM Waste, in the Final EIS.

5.0 PROPOSED ACTIONS

5.1 License Alternatives

92. COMMENT: The No Action Alternative to deny the license constitutes an action. The true No Action Alternative is reflected in footnote 26. I recommend that footnote 26 become the No Action Alternative, and the Deny License Alternative be another alternative. (10)

RESPONSE: The license alternatives have been revised in the Final EIS. The License Proposed Action is written in general terms, and the No Action Alternative more accurately reflects no action. The License Proposed Action and alternatives are described below:

License Proposed Action: Make a determination on the US Ecology license renewal application for continued operation of the commercial LLRW site.

License No Action Alternative: Current license remains in timely renewal.

Renew License Alternative: Renew license with additional operational requirements.

Deny License Alternative: Deny license renewal.

93. COMMENT: The relationship between timely renewal status, license amendments and the relicensing application process should be placed in the text of the EIS. (10)

RESPONSE: This relationship has been described in Section 1.4.1, License, in the Final EIS. The relicensing application process requires US Ecology to submit a license renewal application every five years. The license is in timely renewal from the time the application is received by DOH, and until DOH makes a decision on the application. US Ecology submitted their license renewal application in 1997, and it has been in timely renewal since that time. DOH has decided that significant license amendments will not be made during timely renewal but will wait until a final determination on the license application has been made.

94. COMMENT: The justification for relicensing the Disposal Facility is not provided in the EIS, and the proposed relicensing should be denied. Current data indicate that the contaminants put into the Disposal Facility are much more mobile than anticipated, they have already reached groundwater, and there is no basis for a conclusion that the environmental impacts are negligible as indicated in the EIS. (5)

RESPONSE: Current data, including the data indicating that the radionuclides were more mobile than anticipated, were used to evaluate the impacts of relicensing the site. The preferred license alternative is to renew the license with additional requirements. The justification for selecting this alternative is in the Final EIS under the title “Relicensing Site Without Further Investigation,” Section 1.3, Areas of Controversy, and in Section 1.6.1, License Preferred Alternative.

95. COMMENT: I am concerned that the amount of waste imported under this proposal would cause more cancer along the Columbia River. (70)

RESPONSE: The Radiological Risk Assessment (Appendix II) for the EIS has projected that future waste disposal at the commercial LLRW site would have little or no impact on future cancer rates of residents along the Columbia River. Please see Section 4.4, Post-Closure Radiological Dose, in the Final EIS.

96. COMMENT: The EIS fails to consider a reasonable alternative of having a different licensee operate the site, and to consider the licensee's record regarding investigation of releases from this site, operation of other sites in a manner that prevents releases from the sites, remedial action history at other sites, etc. The EIS fails to consider the link between the end of the sublease and renewal of the license, and the benefits of competing the sublease with consideration of environmental and safety records of applicants/bidders. (29)

RESPONSE: Selecting the licensee is an administrative function and is not a proposed action in the EIS.

97. COMMENT: The EIS needs a scenario where the lease is modified to address liability and remediation needs. (22)

RESPONSE: The current prime lease between USDOE and the state of Washington, and the present sublease between the state of Washington and US Ecology, contain provisions that address contamination and liability.

98. COMMENT: The EIS needs to include a scenario where the state does not renew their lease with US Ecology and it expires in 2005. (22)

RESPONSE: The lease arrangement is not a proposed action in this EIS. However, relicensing US Ecology to continue to operate the site is contingent on a current sublease between the state and US Ecology.

99. COMMENT: Include discussion under the Deny License Renewal Alternative that discusses impacts relative to the Northwest Compact, Rocky Mountain Compact, the USDOE Lease including financial commitment for closure, and any other possible agreements. (10)

RESPONSE: Discussion of impacts to the Northwest and Rocky Mountain Compact states is included in Section 6.5, Socioeconomics, and impacts on closure surety are discussed in Section 6.8, Surety and Closure Costs, in the Final EIS.

100. COMMENT: License enhancements proposed are never disclosed - this is a major violation of the requirements under SEPA to propose mitigation measures. The EIS should consider benefits of requiring encapsulation of all wastes disposed, and define the required improvements in groundwater and vadose zone monitoring (which need to be based, in part, on characterization of releases). (29)

RESPONSE: Additional license requirements included in the Renew License Alternative are listed in Table 3.A of the Final EIS. The specifics of the new license requirements, such as improvements to the monitoring system, are not part of this EIS. More work by the state, including a complete evaluation of the annual monitoring program, will be required before such details are available for inclusion into the license.

101. COMMENT: Alternative 1: Renew License with Operational Enhancements must be re-written to <u>specify the enhancements that will be required</u> for the license renewal. (22)

RESPONSE: Please see the response to Comment #100.

102. COMMENT: The other alternative to renewing the existing license is to renew with "enhancements." The enhancements are a suite of eighteen conditions that DOH would presumably negotiate with US Ecology. Commenting on this alternative is problematic because the DEIS assessment is very subjective and

we do not know which of the enhancements will be selected. Some of the enhancements listed in Table 3-A appear to be of dubious benefit. The use of gamma spectroscopy to identify radionuclides and verify waste activity is credited with increased worker safety and increased knowledge of the source term. The increased knowledge aspect is speculative and the need or usefulness of the knowledge is not explained. The measurement process might, in fact, result in higher worker exposures. (7)

RESPONSE: The gamma spectroscopy requirement in the Renew License Alternative has been revised to read: "Investigate the feasibility of using gamma spectroscopy to identify radionuclides and verify waste activity." The DOH resident inspector already has occasionally been using a portable multi-channel analyzer to verify the existence, not quantity, of gamma-emitting isotopes (e.g., Co-60, Cs-137, Zn-65). The inspector compares this information with the manifest included with the shipping papers. The benefits of formalizing this practice are still being evaluated.

103. COMMENT: There appears to be no consideration in the EIS for installation of a liner in the facility when it is apparent that the existing facility has already contaminated the groundwater. From a technical standpoint, the installation of a liner is based on common sense, especially when there is data showing the uncontrolled migration of contaminants through the sediment. When this reviewer asked about this deficiency, one Department of Ecology employee began justifying this lack of consideration with some obscure regulatory logic. However, regardless of the regulatory environment, the installation of a liner makes technical sense to the extent that less than one half a mile away, the Department of Energy has an operating disposal facility for low-level waste and that facility is lined. Apparently, the DOE justifies the logic of installing a liner regardless of the regulatory environment. This reviewer believes there is sound justification for installing a liner and that the EIS should consider a liner as an alternative in the risk assessment. (5)

RESPONSE: Lined trenches are used at hazardous waste and municipal landfills to provide secondary containment of waste. At the commercial LLRW site, approximately 98% of the waste activity is currently subject to secondary containment. Instead of trench liners, the site uses double containers or lining of individual containers to achieve secondary containment. Thick-walled engineered concrete barriers (ECB) are an example of this type of containment. This type of secondary containment is preferred over trench liners for radioactive waste because it provides increased structural stability, eliminates the potential for contaminated leachate, and requires less post-closure maintenance.

The License Preferred Alternative would require all Class B and Class C waste to be overpacked in ECBs.[1] In addition, secondary containment would be required for Class A LLRW that contains any of the seven nuclides that may contribute to

[1] Wastes that are too large for an ECB would be disposed of in a comparable secondary container.

the hypothetical post-closure dose. These seven radionuclides are iodine 129 (I-129), technetium (Tc-99), uranium 238 (U-238), tritium (H-3), carbon 14 (C-14), uranium 234 (U-234), and plutonium 239 (Pu-239). Please see Section 1.3, Controversial Issues, Disposal of Waste into Unlined Trenches, for a discussion of liners.

104. COMMENT: I support covering the trenches as they are filled, and the lining of future trenches. These actions must be included in any license granted. (45)

RESPONSE: The Preferred Alternatives include increased secondary containment for new waste and a "Close-As-You-Go" Cover Schedule.

105. COMMENT: In reference to additional requirements for stabilizing waste prior to disposal what constitutes an unstable waste? (10)

RESPONSE: Unstable waste is waste that does not meet the requirements of a stable waste. A stable waste will maintain its physical dimensions and its form for a minimum of 300 years when subjected to the weight of overburden and compaction equipment, the presence of moisture, microbial activity, and internal factors such as radiation effects and chemical changes. Structural stability can be achieved by the waste form itself, processing the waste to a stable form, or placing the waste in a disposal container or structure that provides stability after disposal. (5)

106. COMMENT: Back in the 40's and 60's, we made a lot of mistakes in disposing of radioactive waste in an effort to win the war. My concern is that we don't seem to have learned anything. Relicensing an unlined facility is making the same mistakes all over again. (5)

RESPONSE: Please see the response to Comment #103.

107. COMMENT: It is essentially stupid to dump this waste into unlined ditches. They should be fully lined so nothing will leach into the soil. Not even garbage can be dumped on bare ground. (40)

RESPONSE: Please see the response to Comment #103.

108. COMMENT: The EIS should address continued disposal of radioactive wastes into unlined trenches, with no leachate collection and inadequate groundwater and vadose zone (soil column) monitoring - while nearby, we require the wastes from Hanford cleanup activities to be put in a landfill with liners, leachate collection and a superior monitoring system. (29)

RESPONSE: Please see the response to Comment #103.

109. COMMENT: Acceptance of additional waste at the commercial LLRW disposal site must be examined in terms of the context of the Site Investigation. Health and Ecology need to reexamine the waste acceptance criteria for wastes at US Ecology before moving forward. Waste acceptance criteria needs to be redone and the generator's sites inspected to see if their packaging, transporting and manifesting practices are in compliance. (59)

RESPONSE: Waste acceptance criteria were reviewed as part of the EIS. If the license is renewed (preferred alternative), several new or expanded requirements addressing waste acceptance will be included in the license or enacted by DOH. Please see Table 3.A: Requirements for Renew License Alternative, in the Final EIS.

110. COMMENT: The EIS should address that the Department of Health, at the request of the dumpsite operator (US Ecology, Inc.), has proposed to double the total amount of radioactive wastes imported to the state for disposal at the site, and increase the total amount of NARM wastes imported and disposed twelve fold. (29)

RESPONSE: The Preferred Alternative identified for diffuse NARM is 100,000 cubic feet per year. Disposing of 100,000 cubic feet per year of diffuse NARM does not increase the hypothetical maximum dose if the commercial LLRW site is relicensed. Future disposal of diffuse NARM does, however, increase the potential area of exposure to NARM from 40 acres to 80 acres for an onsite resident.

The 100,000 cubic feet per year can be viewed as either an increase or the status quo, depending on the reader's perspective. In September 1995, DOH adopted amendments to WAC 246-249-080 that limited disposal of diffuse NARM to 8600 cubic feet per year. Prior to that time, there was no site limit for diffuse NARM. Within months, US Ecology filed a lawsuit against DOH, contesting the 8600 cubic foot limit. The court entered an order staying the 1995 amendment and imposing a 100,000 cubic foot limit during the rulemaking proceeding. This 100,000 cubic foot limit is in effect today. If you compare the 100,000 limit to the stayed regulatory limit of 8600, then the 100,000 cubic feet would be an increase. If you compare 100,000 to the court ordered limit that has been in effect for the last eight years, then it represents the status quo.

111. COMMENT: The inclusion of source term limits in the license is a reasonable action. (15)

RESPONSE: Source term limits in the license for Ra-226, H-3, I-129, C-14, Tc-99, U-238, U-234, and Pu-239 are included in the Licensing Preferred Alternative. These radionuclides will be included because they are predicted to contribute to a hypothetical post-closure dose for air or for the groundwater pathway.

112. COMMENT: Require a limit on the total source term disposed in order to ensure MTCA will not be exceeded. (29)

RESPONSE: The commercial LLRW accepts no hazardous waste for disposal. Therefore source term limits hazardous wastes are not needed.

113. COMMENT: We need to track where wastes are disposed. (29) (49) (43)

RESPONSE: Under the current license, US Ecology tracks the location of Class B and C waste, ECBs, oils, and chelates. The Preferred License Alternative will require improved tracking methods for all waste types and classes.

114. COMMENT: We need to consider encapsulating the wastes before they are buried. (29) (43)

RESPONSE: Please see the response to Comment #103 addressing secondary containment.

115. COMMENT: Require the same monitoring and waste tracking that Ecology and EPA require for the adjacent ERDF. (29)

RESPONSE: The commercial LLRW site is designed and operated under Chapter 246-250 WAC to receive radioactive wastes, whereas the Hanford “cleanup landfill” is regulated by CERCLA and RCRA to receive hazardous wastes. Operating requirements for each site are tailored specifically to the type of waste currently disposed.

116. COMMENT: The EIS fails to consider alternatives to the use of "random disposal" methodology, including the benefits of requiring the licensee to track placement of all wastes, to utilize methods of disposal that prevent subsidence of wastes when capped, and minimize moisture in trenches and backfill. (29)

RESPONSE: The Renew License Alternative includes improved tracking for all waste types, increased secondary containment, and increased backfill requirements for randomly placed waste containers. Random disposal is used for steel drums but not for other waste containers such as steel boxes. Random disposal of barrels, combined with daily backfilling, was determined to reduce subsidence more than stacking barrels. Please see Table 3.A: Requirements for Renew License Alternative, in the Final EIS.

117. COMMENT: Pg 62. It appears that Class C waste may be placed in HICs, but there is no requirement to do so. If NRC Class C waste is comparable to DOE Category 3 waste, for which either disposal in HICs or in-trench grouting is required, it would seem a similar requirement would be established for Class C waste disposed in the commercial LLRW disposal site. (10)

RESPONSE: Chapter 246-249 WAC requires all Class C waste to meet structural stability requirements. Structural stability requirements can be met by the waste form, or by placing the waste in a high integrity container (HIC). In addition, all Class C waste must be overpacked in an engineered concrete barrier.

118. COMMENT: Consider use of the encasement option now used in the 200 West Area Burial Grounds for the ECB enhancement. The new monolith encasement will replace the HIC vaults by directly encasing waste in the trench. (10)

RESPONSE: DOH will evaluate USDOE's monolith encasement process for future waste disposal.

119. COMMENT: An enhancement requiring solidification of all ion exchange resin, would result in greatly increased cost to waste generators without necessarily improving waste stability. (Note that the description of current practice in Table 10 does not reflect that Class A unstable waste can have cobalt-60 concentrations of up to 50 uCi/cc.)

Increased point-of-origin inspections are also cited as a possible enhancement. To us it seems inappropriate to consider inspections by DOH at generator locations as a condition of the LLRW site operator's license. If such inspections are warranted, they should be conducted under other authorities. Regardless of the enhancements, if any, selected for inclusion in the renewed license, we hope that generators and site users will be afforded an opportunity to comment on those that directly affect their waste management practices. We say this recognizing that any "enhancements" imposed through the license will likely result in increased operating costs and, in turn, higher disposal costs. (7)

RESPONSE: The Renew License Alternative has been revised to eliminate new requirements for ion exchange resin. Point-of-origin inspections will not be a direct license requirement but will be required as part of DOH's oversight program.

120. COMMENT: My experience and observations have led to the conclusion that all radioactive waste should be contained in durable concrete. While there is some uncertainty about the total useful lifetime of durable concrete, it is clear that the durable concrete has a lifetime 25 times longer than standard concrete in the most aggressive soil. Using durable concrete containers for storage or disposal of radioactive material has no apparent down side risk and it is only slightly more expensive than standard concrete. (51)

RESPONSE: Thank you for your suggestion. DOH will evaluate the use of durable concrete at the commercial LLRW site.

121. COMMENT: A decision to stop burying radioactive material and to store it above ground in durable concrete appears, to me, to be very timely for several reasons. Storing all radioactive material securely above ground retains the option of a future use of that material in an effective way. For example, the future benefits from yet-to-be-discovered medical isotopes are incalculable. Industrial uses for radioactive materials that are yet-to-be-discovered may also provide great benefit and financial income. Storage of radioactive material in a Type A container made of durable concrete would retard the start of migration for a time period greater than 500 years and probably thousands of years. (51)

RESPONSE: Above ground burial was not considered a viable alternative because shallow land burial is the presumptive disposal method for LLRW in the United States. Although there are benefits to above ground storage, it is not the recommended practice for permanent disposal of LLRW waste at this time.

122. COMMENT: Using containers that are approved by the Department of Transportation as Type A containers permits some waste streams to be transported over the road and then stored or disposed of in the same containers. In addition, using these DOT approved concrete containers for on-site transfers of radioactive material minimizes the radiation exposure to the waste handlers. (51)

RESPONSE: Thank you for your suggestion. DOH will evaluate your proposal for future waste disposal.

123. COMMENT: Page 63, Table 10. Within the Objective "Minimize radon emanation from trenches," US Ecology believes "Enhanced Administrative Controls" is the preferred alternative. We agree with the objective of minimizing radon emanation from trenches. However, this objective can best be met using administrative controls directed at reduction of worker exposure in conjunction with current NARM disposal methods. A properly engineered final cover placed over the entire disposal area will afford optimal long-term protection. (15)

RESPONSE: The Preferred License Alternative minimizes radon emanation by requiring that discrete NARM be buried at a minimum of 23 feet below grade.

124. COMMENT: The Navy proposes to increase waste stability by reducing specific void space in Class A waste by including Class A Unstable in the <15% void space requirement. Packing radioactive waste or filler material into void spaces in radioactive components such as tanks or large pumps requires workers to come in close contact with radioactive material and use complex ventilation and respiratory protection precautions. As part of the Shipyard's program for minimizing occupational radiation exposure, the Shipyard tries to reduce the need for such work. Therefore, the Shipyard would prefer not to add waste or filler material to meet the <15% void space requirement for Class A Unstable waste if another means of obtaining the stability objective is available. For

example, one of the other proposed enhancements is to improve the stability of Class B, Class C, and Class A Stable waste by requiring Class A Unstable waste to be disposed of in a separate trench. If a separate trench is provided for Class A unstable waste, it should not be necessary to impose the <15% void space requirement on Class A Unstable waste. If the separate trench enhancement is not imposed and additional stability is needed for Class A Unstable waste, the Shipyard recommends that Washington State allow the option of meeting the stability requirement either by utilizing a concrete overpack or by having an inherently structurally strong item such as a very thick walled steel component. (9)

RESPONSE: Exceptions to any void space requirement for Class A Unstable waste would be reviewed on a case-by-case basis. The robustness of the proposed waste container (e.g., thick-walled steel component) would be evaluated during this review by DOH staff. A potential alternative to utilizing the void space with a package for additional waste is the filling of the void with some inert material (e.g., grout).

125. COMMENT: For well over a decade, both the Barnwell disposal site and the Richland disposal site have allowed radioactive waste generators two options for high activity ion exchange resins. One option was solidification using a process meeting U.S. Nuclear Regulatory Commission standards. The other option was to dispose of the resin in a State-approved high integrity container with an additional external concrete overpack to provide long-term physical stability. The Navy has consistently selected the second alternative. The reason for this is that it avoids the occupational radiation exposure associated with having Shipyard workers perform the solidification process. Also, the Navy had unsatisfactory results in the 1980's with both cement-based and non-cement solidification agents for ion exchange resin. Thus, the Shipyard considers the high integrity container/overpack option to be more reliable as well as reducing occupational radiation exposure. From an environmental perspective, the combination of the corrosion resistance of the high integrity container with the long term structural integrity of the concrete overpack provides protection at least as good as solidification. For low activity Class A Unstable ion exchange resins, there should be no need for any special solidification requirement. (9)

RESPONSE: In the Final EIS, the Renew License Alternative contains no new requirements for ion exchange resins. Existing license requirements addressing these wastes will continue if the site is relicensed.

126. COMMENT: The Naval Shipyard currently determines the radionuclide content of radioactive waste using methods consistent with the guidance of the U.S. Nuclear Regulatory Commission. Requiring gamma spectrum analysis of each individual waste package will increase occupational radiation exposure to Shipyard workers without necessarily improving the quality of the radionuclide inventory characterization.

If the gamma spectrum analysis is performed on a small sample of the waste, this sample might not be representative of the entire waste package, and determination of the total package curie content may not be accurate. The Navy's experience with a former requirement at the Barnwell disposal site illustrates this point. In the 1980's, the Barnwell site required that a sample be obtained from each package of ion exchange resin, and that the results of gamma spectrum analysis be provided with each resin package. For shipments of high activity ion exchange resin, the sample had to be only a few resin beads in order not to saturate the detection system. Since only a tiny fraction of the material could be measured this way, it was not possible to determine accurately the total curie content of the package. Further, due to the prevalence of cobalt-60, gamma emitters of regulatory interest such as niobium-94 were present in concentrations too small to be directly measured. Also, obtaining these samples involved additional worker radiation exposure. Barnwell no longer requires a gamma spectrum analysis for each resin container. (9)

RESPONSE: In the Final EIS, the Renew License Alternative requires DOH to investigate the usefulness of gamma spectrum analysis for use by the onsite DOH inspector. The use of gamma spectrum analysis is not intended to be an additional requirement for generators.

127. COMMENT: Gamma spectrum analysis provides no additional information on important non-gamma emitters such as Sr-90, C-14, Tc-99, and H-3. Furthermore, very long-lived gamma emitters such as Nb-94 are normally present in concentrations too small to be directly detected in the presence of the overwhelming cobalt-60 signal. (9)

RESPONSE: Please see the response to Comment #126.

128. COMMENT: If Washington State desires to proceed with the gamma spectroscopy requirement regardless of the above objections, the Navy would request that Washington State consider making the requirement applicable only to high activity Class C waste. The Navy would also request that there be an option for generators such as the Navy with a well defined and characterized radionuclide mixture to obtain an exemption from this requirement. (9)

RESPONSE: Please see the response to Comment #126.

129. COMMENT: Remove already adopted license enhancements from Table 10. (10)

RESPONSE: All license changes made prior to publication of the Final EIS have been removed from Table 3.A (formerly Table 10).

130. COMMENT: We do not see the utility of the Filled Site Alternative. It might be profitable to use the "filled" concept for all alternatives to form a bounding case. Can the site be filled within the next 5-year license period? If not, the projected inventory at the end of the next license period should be used for impact analysis. (10)

RESPONSE: The Filled Site Alternative has been eliminated as a viable alternative in the Final EIS and is only included in the analyses to provide an upper bound for dose projections. The inventory for all cover designs is projected both for the next five-year license period and for the last possible closure date of 2056. To only evaluate the alternatives in terms of the next five years' impacts would not, in the state's opinion, provide a clear picture of all impacts.

131. COMMENT: If the filled alternative is to remain in the EIS, the impacts of transportation should be quantified. (10)

RESPONSE: Please see the response to Comment #130.

5.2 Diffuse NARM Alternatives

132. COMMENT: Has the projection basis for NARM been currently analyzed? What is the basis for either the 36,700 or the 50,000 volumes limit? Discrete versus diffuse NARM needs to be clarified. (10)

RESPONSE: A projection of NARM disposal needs was analyzed for the Draft EIS. The 36,700-cubic feet volume limit is based roughly on the average NARM waste disposed from 1992 to 1996. The 50,000-cubic foot volume was an arbitrary volume selected solely for the purpose of evaluating several different NARM volumes. Current NARM volumes at the commercial LLRW site have reduced significantly over the last five years. For example, in 2002, total NARM disposal was 4,692 cubic feet.

Clarification of diffuse NARM versus discrete NARM has been added throughout the Final EIS. The diffuse NARM proposed action addresses a volume limit for diffuse NARM and does not affect discrete NARM. Discrete NARM is material that is normally high activity and small volume. Examples of discrete NARM are sealed sources from measuring devices, gauges, and radium needles used in medical applications. By comparison, diffuse NARM is normally high volume and low activity. Diffuse NARM includes wastes such as those from mineral processing sites, laboratory trash from the production of accelerator-produced pharmaceuticals, and pipe scale from routine maintenance on oil and gas pipelines.

133. COMMENT: While the court imposed a 100,000 cubic feet per year limit on NARM acceptance, is there a generator requirement (previously 1000 cubic feet per year, per WAC 246-249-080) to obtain DOH approval prior to shipment? (10)

RESPONSE: There is no current individual generator requirement. The 1,000 cubic foot limit in WAC 246-249-080 was stayed by the settlement agreement and is not currently in effect.

134. COMMENT: The EIS does not consider the reasonable alternative of accepting no NARM at all. Why should we take this waste? A reasonable alternative would limit the amount of NARM to the amount generated in Washington and Oregon each year. That's what we do for hazardous wastes and we should do it here. Ensure that the environmental benefits of this alternative are evaluated in the EIS. (29) (22)

RESPONSE: The Final EIS includes a new alternative of accepting no new diffuse NARM. An alternative that only accepts diffuse NARM generated in Washington and Oregon was not included in the Final EIS because it is not legal to accept NARM from some states and not from others. NARM is subject to the Commerce Clause of the U.S. Constitution and cannot be excluded from the commercial LLRW site on a state-by-state basis.

135. COMMENT: If there is no significant risk, why not continue the upper limit at 100,000 cubic feet? What is the cost/benefit to the public of being more restrictive? (30)

RESPONSE: The identified NARM preferred alternative is 100,000 cubic feet per year, without the automatic annual rollover provision. The preferred alternative does include a case-by-case rollover provision. The site operator would be required to submit a rollover request that includes an analysis of impacts from transporting and disposing of the diffuse NARM. DOH would approve, modify, or deny the request based on public health.

136. COMMENT: How does the volume of NARM affect groundwater concentrations of the nuclides shown? (10)

RESPONSE: Diffuse NARM is predicted to have an insignificant effect on groundwater concentrations. Radium (Ra-226) is the primary radionuclide in diffuse NARM. Ra-226 primarily decays into radon gas and contributes to dose via air, not groundwater.

137. COMMENT: Recognize that the proposed addition of 100,000 cubic feet of NARM per year results in a 420 millirem per year dose to the onsite resident after a groundwater well intrusion with the US Ecology Cover, and 120 mrem per year with the Enhanced Asphalt Cover. This equates to a fatal cancer risk of 4.2 E-3 (.42%). MOTCA's standard of one additional cancer per one hundred thousand

persons exposed is exceeded by either of these covers by 840 and 240 times, respectively. Thus, the addition of 100,000 cubic feet of radioactive NARM waste per year must be totally unacceptable, as is an increase to 36,700 cubic feet per year. (29)

RESPONSE: The preferred closure alternative is predicted to contribute 15 millirem per year to the hypothetical onsite dose, and less than one millirem to the hypothetical offsite dose from past disposal of diffuse NARM. If the site continues to be relicensed over the next 50 years, disposal of 100,000 cubic feet per year of diffuse NARM would *not* increase the hypothetical maximum onsite or offsite dose. Disposal of additional diffuse NARM does increase the area of potential exposure for the onsite intruder from 40 acres to approximately 80 acres.

138. COMMENT: DEIS Page 117, Section 4.2.5.1, NARM. We suggest replacing the last two sentences: "While it is conceivable that there would be a contribution from buried NORM to indoor radon through hypothetical Native American sweat lodge use, any actual impact would likely be insignificant and dependent on depth of burial, waste volume and spatial distribution, cover integrity, dwelling design and occupancy factors." (15)

RESPONSE: The Final EIS clarifies that the use of a sweat lodge is a hypothetical assumption that may or may not be true.

5.3 Closure

139. COMMENT: The proposed closure plan does not provide adequate assurances that the long-term performance objective of Chapter 246-250 WAC will be met. Nor does it isolate the wastes from groundwater as required by WAC 246-250-300 or have a monitoring system capable of providing early warning release as required by WAC 246-250-340. (22)

RESPONSE: The approved closure plan must meet all requirements of Chapter 246-250 WAC, including a monitoring system capable of providing early warning. The EIS focused on cover design and the cover construction schedule because these are two closure plan components that have a potentially significant impact on the post-closure dose. Other components of closure, such as monitoring and institutional controls, will be included in the Final Closure Plan. This point has been clarified in the Final EIS.

Long-term performance objectives in Chapter 246-250 WAC require both the general population and inadvertent intruders to be protected after closure. Protection is defined as a dose to the general population of no more than 25 millirem per year plus ALARA. For inadvertent intruders, the Final EIS uses a guidance value of no more than 100 millirem per year plus ALARA. A performance assessment was done for each cover design. The GeoSynthetic

Cover was identified as the preferred cover design because the hypothetical doses were within acceptable limits, RCRA requirements for hazardous wastes were met, and the GeoSynthetic Cover worked well with a phased construction schedule.

140. COMMENT: Before the Closure Plan can be approved (pending action in the EIS), there must be mitigation of the groundwater contamination according to MTCA, and this contamination must be considered in the Closure Plan. (5)

RESPONSE: The Final Closure Plan will be amended, if needed, to consider the results of the 2004 MTCA investigation in the final cover design. The preferred cover construction schedule will construct the final cover in phases. The phased construction will allow the results of the MTCA investigation to be incorporated into the cover design as it is constructed.

141. COMMENT: Section 4.1.3. The EIS should be revised to fully consider the US Ecology Site Investigation. The Washington Department of Ecology should clarify its position concerning the adequacy of the proposed closure plan in view of the latest data. To the extent practical, any suspected releases should be addressed under the closure provisions of the US Ecology License. (10)

RESPONSE: The Final EIS was revised using a recalibrated groundwater model based on radionuclide data obtained during the US Ecology Site investigation. The revised model predicted that the schedule for constructing the cover is as important, or more important, than the cover design in reducing hypothetical doses. Based on the model results, the GeoSynthetic cover and the Close-As-You-Go Schedule were identified as the preferred alternatives.

142. COMMENT: Taking into consideration the EPA 15 millirem per year guidance, the closure alternatives need to be rethought. (59)

RESPONSE: The identified preferred cover design and cover schedule are predicted to result in hypothetical offsite doses ranging from 8 to 22 millirem per year for a resident living his/her whole life at the fenceline of the commercial LLRW site. These doses are below the NRC and DOH 25 millirem per year regulatory standard.

143. COMMENT: The US Ecology site is a hazardous waste site and its operation and closure plans must recognize this. The EIS needs to include alternatives that recognize that this is a hazardous waste site and that both closure and license renewal must comply with RCRA and MTCA. At a minimum, a RCRA compliant cap should be required along with a RCRA liner and leachate collection system. (22)

RESPONSE: The commercial LLRW site does not accept hazardous or mixed waste, so RCRA is not an applicable regulation for license renewal. For closure,

the GeoSynthetic Cover was identified as the preferred cover design, in part, because it is RCRA compliant and will address past disposal of hazardous wastes.

144. COMMENT: Require the closure plan to meet the requirements of Washington's Dangerous Waste rules for closure of dangerous waste landfills. (29)

RESPONSE: The Department of Ecology has determined that the preferred cover design alternative (GeoSynthetic) meets EPA's RCRA Minimum Technology Requirements for Cover Designs.

145. COMMENT: Recognize that the only cover alternative considered in this EIS, which approaches MOTCA standards for human health risk, is the enhanced asphalt cover, and that in and of itself, this cover will not be adequately protective and that subsidence in the trenches may reduce its protectiveness. Therefore, additional caps must be considered along with limits on total radioactive source term, liners and other measures to attain a closure that will not cause cancer risks to offsite or onsite Native Americans or rural residents, with or without reasonably foreseeable intrusion to the dumpsite. (29)

RESPONSE: The state determined that MTCA standards would be used to set clean up levels for hazardous wastes, but not for radioactive wastes at the commercial LLRW site. Several of the cover alternatives, including the preferred alternative GeoSynthetic Cover, meet RCRA cover design requirements. Additional remedial actions for hazardous wastes will be determined following the 2004 MTCA investigation. Please see the response to Comment #54 for more discussion of the applicability of MTCA at the commercial LLRW site.

146. COMMENT: If the source of a contaminant cannot be resolved, then the EIS must assume that the source is the Disposal Site, and it must be dealt with in the Closure Plan before that plan can be approved. (5)

RESPONSE: For the purposes of groundwater modeling, the radionuclides in the vadose zone were assumed to originate from the commercial LLRW site. The model was revised accordingly and the results are reflected in the Radiological Risk Assessment (Appendix II) and Section 4.4, Post-Closure Radiological Dose, in the Final EIS.

147. COMMENT: The EIS must define and discuss what provisions are made by the proposed alternatives to ensure that the 1994 MOU between Ecology and Health is abided by, and the goals of capping the landfill can be met expeditiously without compromising or ignoring the need to cleanup up the hazardous wastes buried at the site. (22)

RESPONSE: The preferred alternatives in the Final EIS are consistent with the 1994 Memorandum of Understanding (MOU) between DOH and the Department

of Ecology. The preferred cover schedule constructs the cover in three phases. By constructing the cover in phases, modifications, if necessary, can be made to the final cover design following the completion of the 2004 MTCA investigation.

148. COMMENT: Project managers have stated a concern that site remediation could create unacceptable risks for site workers. If this is the basis for dismissing the need for more actions, it should be openly discussed in the EIS, supported by data, and discussed in contrast to other clean-up needs at Hanford where similar risks are evident. (22)

RESPONSE: The need for remedial actions, other than constructing a cover over the site, will be determined following completion of the 2004 MTCA investigation. Impacts to worker health as a result of additional remedial actions will be evaluated at that time.

149. COMMENT: We are unable to reconcile the descriptions for the alternatives given in Section 1.2.3, and figures presented in Section 3.3. It would help to use for a reference point the minimum distance between the waste and the grade. (10)

RESPONSE: The alternatives for the proposed actions in the Final EIS are introduced in Section 1.5, Alternatives, of the Executive Summary. Every effort has been made to tie this section into the more thorough descriptions presented in Section 3.0.

150. COMMENT: Site Closure in the year 2000 is discussed here and elsewhere in the EIS. Please update the analysis to a current schedule. (10)

RESPONSE: The Final EIS has been revised so that if the site were to be immediately closed (Deny License Alternative), the site would cease accepting waste in 2003 and closure would begin in year 2005.

151. COMMENT: Closure design should consider removal or stabilization of the treatment/storage tanks and remediation of the contaminant plume. (10)

RESPONSE: The tank farm was permanently closed in 1987. Liquid from the five steel tanks was solidified and disposed in Trench 11A. The two smaller tanks were removed and the other three tanks were closed in place using concrete. Final closure includes a cover over the storage tank area. The state will determine if there is a need for additional remedial actions for the tanks following the 2004 MTCA investigation.

152. COMMENT: The EIS states that institutional controls will be maintained for 100 years (year 2056 – 2156). However, the lease expires in year 2064. Is this action committing DOE to continue institutional control after reversion to federal control, or will the state continue to bear the cost? (10)

RESPONSE: The Final EIS explains that the commercial site is a 100-acre site in the middle of the much larger contaminated central plateau area of Hanford. USDOE has designated the central plateau for Industrial-Exclusive use in the final Hanford comprehensive Land Use Plan (CLUP) EIS (USDOE 1999). It is likely that waste management activities, other than the commercial site, would make the entire central plateau unfit for residential use or other long-term uses for an indefinite period. USDOE is planning to use institutional controls to restrict public access to the central plateau for the foreseeable future. It will be every future generation's responsibility to ensure that these controls remain in place for as long as necessary.

The lease between the state and USDOE expires on September 9, 2063. Under the terms of a Perpetual Care Agreement, USDOE can sell the commercial LLRW site to the state. If USDOE does sell the site to the state, the state would continue to bear the cost of maintaining the site. If USDOE retains ownership, they will gain control of the PC&M Fund and be responsible for funding the institutional control period. The PC&M Fund currently has about $35 million.

DOH completed a surety analysis for the PC&M Fund in 2003. As of May 31, 2003, the PC&M Fund totaled $34,964,815. This fund continues to grow through interest and a $1.75 per cubic foot surcharge on waste. The surety analysis for the PC&M Fund showed that if the site were closed in 2056, the 100-year cost in real dollars would be $28,025,445. Assuming a 2% growth rate, the PC&M Fund will have $35.8 million in year 2005, and $115.11 million in year 2064. Please see Section 6.8, Perpetual Care and Maintenance, in the Final EIS.

153. COMMENT: Presumably, under the No Action Alternative, DOH would not approve a cover, then what? Is the presumption that DOH would approve the other mentioned alternative cover in this case? (10)

RESPONSE: The Cover Design No Action Alternative is the Site Soils Cover. This alternative is "no-action" because it simply continues current practice and does not require approval of a cover design. The GeoSynthetic Cover was identified as the preferred alternative.

154. COMMENT: The closure alternative descriptions do not reflect the statement in the DEIS (Section 3.3.1 9, pg 64) that these closures need not be followed exactly, "but…must meet or exceed the performance and reliability of the selected alternative." However, what that performance and reliability must be is not apparent. (10)

RESPONSE: The performance and reliability parameters for the preferred cover design alternative are included in Section 1.6, Preferred Alternatives, of the Final EIS.

155. COMMENT: There is a disparity between the time of closure of the commercial site and the Hanford Solid Waste program sites, namely 2056 in the former and 2046 in the latter. What are the implications of this difference? (10)

RESPONSE: The state does not see a problem with different closure dates for the commercial site and Hanford facilities.

156. COMMENT: The closure alternatives must not be limited to consideration of a site cover. The closure alternatives make no room to incorporate the results of the additional site investigations and associated corrective actions that could be required. As a result, the site could end up with a mighty fine cover that prevents infiltration from rainwater but does little to address seepage into groundwater from leaking containers. The EIS must present an alternative to what would be required if MTCA were to be enforced at the US Ecology site. (22)

RESPONSE: The cover construction schedule constructs the final cover in three phases. The phased construction will allow the state to incorporate results from the 2004 MTCA investigation into the final closure of the site without disturbing or removing the first phase of the cover.

157. COMMENT: The closure alternatives need to be further developed to include contingency plans and to address the uncertainties that are vaguely alluded to in the EIS. (22)

RESPONSE: We are assuming the commenter is referring to post-closure contingency plans and uncertainties. A post-closure care and maintenance (PC&M) evaluation was done for the 100-year period following closure. This evaluation included a maintenance and care plan that addresses uncertainties and contingencies for the 100-year period, and is discussed in Section 6.8.3, Perpetual Care and Maintenance, in the Final EIS. The evaluation showed that more than adequate funds are available to fund the PC&M plan.

158. COMMENT: None of the alternatives discuss the elimination, to the extent practicable, of long-term maintenance, or a discussion of design features intended to eliminate the need for active maintenance (as required in WAC 246-250-0505). The closure plan should attempt to minimize the need for maintenance and include alternatives that address this. (22)

RESPONSE: There is little difference in terms of long-term maintenance between the cover designs. All of the covers, except the Site Soils Cover, have certain characteristics designed to reduce long-term maintenance. These include surface gravel for reduction of wind erosion, silt loam soils to enhance plant growth, and revegetation with native plants. Long-term maintenance is discussed in Section 4.4.1, Cover Design Reliability, in the Final EIS.

159. COMMENT: Be honest. If you are proposing to close the landfill with little or no additional site characterization, you must discuss that openly in the EIS. (22)

RESPONSE: Site characterization is currently ongoing at the commercial LLRW site, and will continue during operations and after closure of the site.

5.3.1 Cover Source Materials

160. COMMENT: The EIS should address the problem that specific site soils may not be available from a Hanford site source. Transportation activities, evaluations and accident scenarios have not been included for cover materials. (10)

RESPONSE: The preferred method of obtaining soils or other materials for cover construction is to purchase the soils from an established offsite vendor. The risk of accidents associated with the transport of these soils is included in 4.3, Cover Construction Risk, in the Final EIS.

161. COMMENT: The source of the cover material and the impacts of acquiring that material should be disclosed in the EIS. Impacts to consider include habitat and cultural resource destruction at the borrow site, accidents and road wear from transportation of fill material. (10)

RESPONSE: The majority of cover materials are planned to come from an offsite source. At least one vendor has been located in the vicinity that could provide the necessary material. Impacts from transport of the material to the site are discussed in Section 4.3, Cover Construction Risk, and Section 6.4, Resource Commitments, in the Final EIS.

162. COMMENT: Include resource commitments in Tables 2, 3, 4, 5. These are particularly important in terms of fossil fuel consumption and use of silt-loam soils and bentonite clay. (10)

RESPONSE: A discussion of resource commitments has been included in the Final EIS in Section 6.4.

163. COMMENT: The term “site sand” is not defined in figures 7 – 12. If the implication is that surrounding soils would be pushed up over the disposal site, the environmental impacts of that action need to be addressed. Specifically, the amount of Washington State designated “priority habitat” shrub-steppe that would be destroyed should be disclosed, along with mitigation measures. (10)

RESPONSE: The term "site sand" refers to the site soils at the commercial LLRW site. Site soils are primarily sandy loams and loamy sands and have a high sand content and low organic matter. Each cover design alternative has a different volume requirement for site soil. The majority of the site soil needed for cover construction will come from the disturbed area surrounding the trenches.

Depending on the final cover design, some of the site soil may need to be excavated from the 15-acre undisturbed area in the northwest corner of the site. The potential impacts to the shrub-steppe habitat of this 15-acre area are included in Section 5.4, Biological and Ecological Resources, in the Final EIS.

6.0 SHORT-TERM RISKS

6.1 Operational Risk

164. COMMENT: Pg. 77. There is something wrong with the formula in Table 11. There are three non-zero incident rates for which there were no lost work days. The number of FTE's should be shown in Table 11 for each year. (10)

RESPONSE: Table 4.A (formerly Table 11 in the Draft EIS) has been revised to correct these inconsistencies.

6.2 Construction of Covers

165. COMMENT: Pg. 82. The analysis for construction of the cover should include the number of worker hours involved in construction of covers and using standard injury factors, present the impacts of construction. The impacts should be in direct proportion to the amount of hours needed to construct the covers. Re-licensing will result in larger covers and will increase construction risks. (10)

RESPONSE: The EIS was not intended to serve as an engineering document where technical specifications and construction details would be included in such detail as to estimate worker hours. This type of information will be included in subsequent engineering plans and specifications. Section 4.3, Cover Construction Risks, discusses the relative risk of constructing the cover designs. All cover designs require standard and well-known construction methods. None of the designs have a significantly higher construction risk.

6.3 Transportation Risk

166. COMMENT: Pg 79. If there has been no release of radioactive or hazardous material as a result of transportation accidents, say so. (10)

RESPONSE: There have been two accidents involving transportation of radioactive waste to the commercial LLRW site. The first accident occurred on January 16, 1987, on Highway 243. The truck jackknifed on black ice and skidded off the shoulder of the road. No radioactive material was released. A second accident occurred on December 31, 1987. A tractor-trailer overturned on Stevens Drive in the City of Richland. Workers were dispatched from Hanford and the contamination was immediately cleaned up.

167. COMMENT: The EIS obscures why the US Ecology site was shut down in 1979. The document fails to mention the “transportation and shipping problems”. (22)

RESPONSE: In the second paragraph on page 41, the Draft EIS states, “On October 4, 1979, transportation and shipping problems caused Governor Dixie Lee Ray to close the commercial LLRW site. On November 19 the commercial LLRW site reopened with more stringent transportation and shipping requirements.” This information is also included in the Final EIS in Section 4.2, Transportation Risk.

168. COMMENT: The EIS has not considered the fact that up to 50% of individual trucking companies bringing waste to the site have had their trucks arrested at the state border for safety violations. (29)

RESPONSE: Every truck transporting radioactive waste and/or materials into the state of Washington is required to have a safety inspection by the Washington State Patrol. Those vehicles that constitute a road hazard are placed out of service and are detained at the Port of Entry until the vehicle is repaired. In memos from the State Patrol to DOH dated February 12 and 14, 2001, the State Patrol noted the following:

“In 1997, 165 vehicles carrying radioactive waste were inspected. Of those 165, 18 (10.91%) were placed out of service. In 1998, out of 304 trucks inspected, 28 (9.21%) were placed out of service. In 1999, 423 trucks were inspected and 28 (6.62%) were placed out of service, while in year 2000, 22 (3.42%) trucks out of 643 were place out of service.”

Among the most noted violations were items such as log book problems, brake adjustments, lights, and flat tires. It should be noted that these inspections included many vehicles destined to facilities other than the commercial LLRW site.

169. COMMENT: Establish a firm policy and include in the site license provisions that bar the use of the commercial LLRW dump for air-transported wastes. (29)

RESPONSE: At this time, there are no plans to categorically exclude wastes transported via air. Air transported wastes, although rare, are allowed at the commercial LLRW site if all regulations and safety requirements are met. Air transported wastes are evaluated on a case-by-case basis.

170. COMMENT: The state must carefully reconsider the hazards posed by the transport of nuclear waste from all sources-–by air and by truck—into the Northwest. (52) (43) (29) (36) (70)

RESPONSE: A discussion of risks from truck, rail, air, and barge transport of waste has been included in Section 4.2, Transportation Risk, in the Final EIS.

171. COMMENT: The EIS failed to disclose that US Ecology imported NARM waste by airplane to the site in 2000, and failed to consider the risks of air transport and failed to propose barring air transport of waste to the site in the site license. (29)

RESPONSE: The Final EIS includes a brief discussion of foreign NARM waste in Section 2.3.2, NARM Waste. The Draft EIS addressed transport risk solely via truck shipments because 99% of the waste disposed at the commercial LLRW site is shipped by truck. The Final EIS includes a discussion of risk from other forms of transport, including air, in Section 4.2, Transportation Risk.

172. COMMENT: The EIS does not adequately address the impact or risks of allowing the 400 to 1000 more truckloads of waste that would be brought into Washington State each year if you increase the NARM limit to 100,000 cubic feet per year. I am not satisfied the EIS looks adequately at each route, especially I-90 and I-84 through Umatilla. I also did not see the rollover provision addressed in the transportation risks. (36)

RESPONSE: The average truck carries 800 to 1000 cubic feet of waste. This means diffuse NARM disposal could result in up to 100 to 120 trucks per year if the full 100,000 cubic feet per year were actually disposed at the site. Full utilization of this limit is unlikely. For example, although the 100,000 cubic foot limit is currently in place, in 2002, fewer than 5000 cubic feet of NARM (five to eight trucks) was disposed.

Risk was not calculated for the rollover provision because it was uncertain how or if the rollover provision would ever be used. That uncertainty, in part, contributed to a preferred diffuse NARM alternative of 100,000 cubic feet with no automatic rollover. The preferred alternative does include a case-by-case rollover clause. A rollover request would be submitted by the site operator and would include an analysis of impacts from transporting and disposing of the diffuse NARM. DOH would approve, modify or deny the request based on public health.

173. COMMENT: The DEIS does not address the risks involved in transporting 100,000 cubic feet per year of NARM. (77)(43)(29)

RESPONSE: The EIS does address the risk of transporting 100,000 cubic feet per year of diffuse NARM. Diffuse NARM is transported to the site via truck. The additional transportation risk of 100,000 cubic feet of diffuse NARM is predicted to be less than one in 1,000,000,000 additional fatal cancers. These risks are discussed in Section 4.2, Transportation Risk, in the Final EIS.

174. COMMENT: We strongly oppose increasing the NARM limit. We're most concerned about the potential doubling of radioactive wastes moving across our state's highways. Ominously, transport isn't limited to land, as the air shipment of Spanish NARM waste to Moses Lake this past July demonstrated. (38)

RESPONSE: Please see the responses to Comments #172 and #173. The NARM limit of 100,000 cubic feet per year only applies to diffuse NARM. The NARM received from Spain was discrete NARM. Discrete NARM is high in activity and low in volume, and is therefore a likely candidate for air transport. It would be cost-prohibitive to transport diffuse NARM by air.

175. COMMENT: The predicted transportation risk is not correct and inadequately addressed. You should include the emergency room factor, and regional and local hospital capabilities that might be needed in the event of a transportation accident. Workers have told me that they are absolutely not prepared to deal with a catastrophic nuclear event. Local EMS response teams do not have the facility, training or equipment to moderate exposure to radioactive materials. This information must be included in the EIS. (79)

RESPONSE: There are three Tri-City hospitals specifically trained to deal with a catastrophic radiological event. All three hospitals maintain supplies and receive annual training for receiving and caring for patients from a nuclear event. Outside of the Tri-Cities, such as along the transportation routes to the commercial LLRW site, there is some statewide training offered to first responders and hospitals. Some of the courses address radiological hazards that might be associated with a transportation accident. Please see Section 4.2.1, Emergency Management Services, in the Final EIS.

176. COMMENT: Under the "no-action" alternative, the license would not be renewed and the facility would close. We believe that the impacts of this scenario are understated. For example, it is inconsistent to suggest that waste generators will send their wastes to other LLRW sites (DEIS pages 61 and 126) with longer trucking distances (page 127) and to also conclude that any transportation risk will be eliminated under the no-action alternative (pages 10 and 81). The existing negligible transportation risk may in fact be increased, if, as suggested in the DEIS, wastes are shipped to other disposal sites. (7)

RESPONSE: The state agrees that transportation risks may increase outside of Washington if the commercial LLRW site is closed. However, transportation risks as well as all other risks discussed in the EIS are quantified only within Washington State.

7.0 ENVIRONMENTAL MONITORING

7.1 General Comments

177. COMMENT: The US Ecology Site Investigation results are key to the validity of this EIS of operations, evaluation of the site uncovered, and evaluation of covers. The lack of detailed discussion and data, particularly historical and current in a useable form (Pages 54-58 and 105-109) makes the connection very difficult. Expand the EIS to include monitoring locations, discussion of monitoring actions

in general including historical data, current data, and resulting conclusions, environmental profile of the uncovered site, and how this data can/will be used to make decisions/influence closure strategy. (10)

RESPONSE: The historic and current environmental monitoring at the commercial LLRW site is discussed in Section 2.4, Environmental Monitoring, in the Final EIS. Discussion of how these data were used to project post-closure doses is included in Section 4.4, Post-Closure Radiological Dose. Data from both the annual monitoring program and the US Ecology Site Investigation are also discussed in Sections 4.2.1, Earth; 4.2.2, Water; 4.2.3, Air; and 4.2.4, Biological and Ecological Resources.

178. COMMENT: There are currently only 8 groundwater wells that are monitored quarterly on the site (1 well per 12.5 acres). How does this compare to other dangerous waste landfills required to do site characterization? (22)

RESPONSE: Placement of groundwater wells is based on many factors in addition to site size. The commercial LLRW site has three wells upgradient and four wells downgradient. RCRA requires a minimum of one well upgradient of a site, and three wells downgradient.

179. COMMENT: A number of Hanford studies have indicated changes in the direction of groundwater flow. Will this have an impact on the LLRW site? (10)

RESPONSE: Groundwater gradients are monitored on a regular basis at the commercial site. The groundwater gradient is very shallow across the site. At this time, changes in groundwater elevations at Hanford have not significantly impacted the direction of groundwater flow at the commercial LLRW site.

180. COMMENT: There is no consideration for past documented reversals in the groundwater flow direction due to releases of effluent in the 200 East Area as documented in Zimmerman, (et al., 1986). The area underneath the Disposal Site was subjected to such changes resulting from effluent releases in the 200 E Area and from the BC Cribs. (5)

RESPONSE: Please see the response to Comment #179.

181. COMMENT: Require the site to have a groundwater monitoring system that meets the requirements of RCRA and Washington's Dangerous Waste law. (29)

RESPONSE: The groundwater monitoring system exceeds the minimum RCRA requirements. However, the Department of Ecology will evaluate the groundwater monitoring system during the MTCA investigation to determine if more wells are needed to characterize impacts from the disposal of hazardous wastes. Please see the response to Comment #178.

7.2 US Ecology Site Investigation

182. COMMENT: The EIS says it is not possible to determine from the data if waste from the site is contributing to the groundwater concentrations. Does that mean we don't need to worry about that? Without this data, and without apparently understanding the hydrogeological system, can we go ahead with the EIS? (5)

RESPONSE: Although it is not clear how much the commercial site is contributing to groundwater contamination under the site, the state has determined there is enough understanding of the overall hydrogeological system to go forward with the EIS. Going forward with the EIS allows the state to make important decisions on the proposed actions. To delay action on the EIS would mean that the license would stay in timely renewal, thus keeping the current license in effect. Additional license enhancements such as expanded secondary containment would be delayed. A delay in the EIS also means that decisions on the cover design and cover schedule would not be finalized. The groundwater model predicted that constructing a low-permeability cover over all waste in year 2005 would result in significant reductions in the future dose. The state finds it unacceptable to delay the construction of the impermeable cover past this date.

The annual environmental monitoring program and the 2004 MTCA Investigation will continue to provide further understanding on the hydrogeological system. The preferred alternatives for closing the site will allow incorporation of any pertinent new information into final closure of the site.

183. COMMENT: The EIS construes and ignores the US Ecology Site Investigation data that was readily available during the preparation of the EIS. The groundwater contamination data was included in an errata sheet as if it had no bearing on remedies that would be appropriate to the site. In discussions regarding the presence of TCE, chloroform, plutonium, and uranium, the EIS dismisses some contaminants as being from other sources, but provides little supporting information for such conclusions. The EIS fails to discuss that some contaminants are very likely from on-site sources, and obscures the nature of the uncertainties regarding the contaminants. (22)

RESPONSE: Several radionuclides detected in the vadose zone during the US Ecology Site Investigation were used to revise the groundwater model and the Radiological Risk Assessment (Appendix II). The data on non-radioactive hazardous substances is not yet complete enough to use to predict future impacts. Modeling for hazardous constituents will be done following the completion of the 2004 MTCA investigation.

184. COMMENT: This reviewer is concerned about the apparent bias in the document in attempting to minimize and ignore significant problems or potential problems discovered by the US Ecology Site Investigation. For example, the Errata Sheet states, "the concentrations for some of these radionuclides and

hazardous substances are higher in the upgradient wells than in the downgradient well, indicating the source is, at least partly, from activities elsewhere on Hanford". This statement was used as justification to dismiss and ignore the contaminants like TCE and plutonium that originated from the Disposal Facility. For a technical document written by two State Agencies that have the responsibility to protect the health and safety of the people of Washington State, the bias is unacceptable and it causes this reviewer to recommend that an independent, third party that is not under political pressure to re-license this facility rewrite the EIS. (5)

RESPONSE: The state does not have the data to say conclusively whether the contaminants found in the groundwater are originating in whole or in part from the commercial LLRW site, or elsewhere. To remedy any appearance of bias, implication as to the source of the contaminants detected in the groundwater has been removed from the Final EIS.

For the Final EIS, DOH assumed that the radionuclide vadose zone data (under Trench 5) are accurate and were not a result of lab contamination. These radionuclides include strontium 90, nickel 63, technetium 99, plutonium 239/240, and uranium 238. The concentrations of the radionuclides in the vadose zone were used to calibrate the groundwater model and make post-closure predictions on impacts to the groundwater and public health. Groundwater modeling for non-radioactive hazardous constituents will be done following completion of the 2004 MTCA investigation.

185. COMMENT: Trichloroethylene (TCE) was detected in the 3rd quarter of 1998 in the groundwater in well MW3 at a level of 5.70 ug/L and it increased in the 4th quarter of 1998 to a value of 10 ug/L (see US Ecology, 1999 Appendix 1-1). This monitoring well is located on the downgradient side of the facility (East side). The only source of TCE that could be considered upgradient of the Disposal Site is the disposal cribs in the 200 West Area. However, a review of the TCE contamination plume data from beneath the 200 W Area reveals that these small plumes are isolated as defined by a minimum contour of 5 ug/L. Further, if one reviews the data from the monitoring wells between the Disposal Site and the 200 W Area, one finds that no TCE is or has been detected in most of the wells, and the maximum values detected adjacent to but near the 200 W Area TCE plume are about 0.5 ug/L. Therefore, it is extremely difficult to support an argument that the TCE originated from "activities elsewhere on Hanford" as suggested or implied in the EIS (Errata Sheet, October 12, 2000 for pg 107-108). The conclusion reached by this reviewer is that the TCE clearly originated from this Disposal Site. That conclusion along with all of the implications that the waste site contamination has already reached groundwater must be considered in the EIS. (5)

RESPONSE: Although the data indicate the presence of a TCE plume, there is insufficient data from upgradient and downgradient wells to determine the source

of TCE detected under the commercial LLRW site. Different transport processes control contaminant migration, depending on whether the contaminant dissolves in water. Most Dense Non-Aqueous Phase Liquids (DNAPLs) are highly chlorinated hydrocarbons (e.g., carbon tetrachloride, PCBs, tetrachloroethylene). Also, geology, rather than hydrology, may influence the migration of free-phase DNAPLs. DNAPLs migrate downward through the saturated zone due to density, and then migrate by gravity along less permeable geologic units and even in aquifers with primarily horizontal groundwater flow. Additional data gaps concerning DNAPLs will be identified in the 2004 MTCA investigation.

186. COMMENT: There is an argument presented in the statement in the EIS that because a contaminant or radionuclide is higher in concentration in an upgradient well than in a down gradient well, the contaminant could not have originated from the Disposal Site. This argument does not consider the fact that the groundwater gradient at this site is relatively flat, and local inhomogeneities in the stratigraphy create local variations in groundwater flow direction as exemplified by this exact condition in the 200 West Area beneath the SX Tank Farm. With only six groundwater monitoring wells, there is not enough data to support the statement that all of the up-gradient wells are in fact, up gradient of the waste trenches. (5)

RESPONSE: The Final EIS has removed statements as to the implication of the source of the contaminants detected in the groundwater under the commercial site. Groundwater gradient at the commercial LLRW site is evaluated on a regular basis. There are seven monitoring wells used to monitor the site. At this time, the state is continuing to consider wells 9, 9a, and 13 as upgradient wells.

187. COMMENT: Groundwater contamination data indicate that chloroform contamination originated from this facility. A review of the chloroform concentration data from groundwater monitoring wells around the site does not support the argument that this contaminant originated from off-site. If additional data is available that supports the argument for another source, that information should be included, discussed and presented in such a manner that another source is demonstrated. Otherwise, the Disposal Facility should be designated as the source. (5)

RESPONSE: At this time, there is not enough data to determine the source of the chloroform in the groundwater at the commercial LLRW site. Any statements that imply the known source of contaminants have been removed from the Final EIS. The 2004 MTCA investigation may provide more information on the source of such contaminants.

188. COMMENT: The greatest concern with the discussion on the US Ecology Site Investigation is the implication in the EIS that the hazardous waste contamination is from off-site sources. The US Ecology Site Investigation and historical site data clearly indicate that a portion of this contamination is from on-site. (22)

RESPONSE: Please see the responses to Comment #187.

189. COMMENT: The EIS states that the detection of plutonium does not fit with the model, and so therefore plutonium cannot really be present. Plutonium when bound with organics has been shown to be highly mobile, but the EIS did not consider this. According to a 1985 review of the facility, there are at least 80 pounds of TRU waste disposed at the commercial LLRW disposal site, and it is mainly plutonium. Plutonium was discovered in the vadose zone. I am concerned that if plutonium is now being discovered in the groundwater, what is coming down the pike? You must answer the questions about the plutonium before you can proceed with this EIS. (5)

RESPONSE: In the Final EIS, the groundwater model for radionuclides was revised based on the assumption that a mobile fraction of radionuclides, including Pu-239, has essentially moved through the vadose zone at the rate of water. There are not enough data to determine if this mobile fraction is the result of organics or some other physical or chemical driver. The revised model predicted that Pu-239 would contribute to the hypothetical post-closure groundwater dose 1,000 years after closure.

190. COMMENT: In the US Ecology Site Investigation, you need to consider the possible combinations and effects of organics and radionuclides as a way of explaining why radionuclides may be at depths where not expected. (10)

RESPONSE: The US Ecology Site Investigation indicated that contaminants were deeper in the vadose zone than expected, but it did not provide evidence as to the reason why. One objective of the 2004 MTCA investigation is to further understand the processes in the vadose zone that may contribute to contaminant transport.

191. COMMENT: The summary provided in the EIS fails to mention the US Ecology Site Investigation findings that methane and/or carbon dioxide generation at the site may force chemicals into the vadose zone if the gases are trapped by the landfill cover, and that this potential should be further examined to ensure an adequate closure design. The EIS also fails to note the investigation's conclusion that the soil gas samples from the west end of trench 5 indicate that organic decomposition may be transporting chemical and radioactive wastes into the vadose zone. (22)

RESPONSE: The 2004 MTCA investigation will further evaluate the rate of methane and/or carbon dioxide generation at the commercial LLRW site, and its influence on contaminant transport. The preferred Cover Schedule Alternative will allow modifications to the cover, such as gas venting, if determined necessary by the 2004 MTCA investigation.

192. COMMENT: Questions remain about what was released, how deep the contaminants have migrated, and what the environmental impacts are. According to Department of Ecology employees, there was discussion of caissons at the site prior to conducting the phase I and 2 US Ecology Site Investigation, and the possibility of additional investigation of the caissons was dismissed by DOH and Ecology officials. The justification for not investigating this waste and not determining the environmental impacts of what was released at the caissons must be stated, and a complete discussion of the caissons must be included in the EIS before the EIS can be finalized. A key goal of any environmental site investigation is to review and assess potential environmental threats. In this case, it was not done as a part of the US Ecology Site Investigation. (5)

RESPONSE: Phases 1 and 2 of the US Ecology Site Investigation targeted the areas the state determined to be the most likely to release contaminants. This included the oldest trenches with the least reliable waste containers. These trenches also contained the largest volumes of non-radioactive hazardous waste. Based on these criteria, the caissons were not selected to be part of the US Ecology Site Investigation. A discussion of the caissons has been included in Section 2.3, Waste, in the Final EIS.

193. COMMENT: On page 57, the EIS states that the results of the US Ecology Site Investigation suggest inaccuracies and that DOH will resample the groundwater and the vadose zone to better understand the radionuclides in them. When will this occur? How will it impact the license renewal and closure plan? (22)

RESPONSE: DOH and US Ecology conduct an ongoing groundwater monitoring program for radionuclides at the commercial LLRW site. Since the completion of the US Ecology Site Investigation, the state has collected an additional four years of data. The Department of Ecology will conduct a MTCA investigation in 2004 to further study non-radioactive hazardous substances. Additional remedial actions that result from the 2004 MTCA investigation will be included in the final closure plan.

194. COMMENT: The levels of Pu-239/240 reported in Table 23, pg 107 of the EIS are not correct. According to the US Ecology Site Investigation, Appendix 1, Pg 7, Pu 239/240 was detected in downgradient well MW3 at a level of 0.247 pCi/L and in an upgradient well at a level of 0.107 pCi/L. Both values are well above the 0.06 pCi/L MDA and are very significant, relative to a potential health risk. (5)

RESPONSE: We apologize for this confusion. Data from the ongoing environmental monitoring program, not the US Ecology Site Investigation, were used for Table 23 in the Draft EIS. In the Final EIS, tables in Section 5.0, Affected Environment, have been revised to include both the annual environmental monitoring data and the site investigation data.

195. COMMENT: In 1991, tritium was measured in the vadose zone sediment at very high levels some distance from the burial trenches. This reviewer was involved in a discussion of that tritium detection in 1992 with the DOE. There is no mention of that event in any of the documents reviewed, and it is not included in the EIS. That issue must be discussed, as it should have been investigated in the phase I and 2 US Ecology Site Investigation. Until all such data and information are included in the investigation and the EIS, the pending actions in the EIS cannot be justified. (5)

RESPONSE: Tritium was one of the parameters to be analyzed in the vadose zone gas during the US Ecology Site Investigation. However, there was insufficient vapor in the vadose zone gas samples to allow H-3 analysis.

196. COMMENT: Page 55, Section 2.5, US Ecology Site Investigation, Non-Radioactive Hazardous Constituents. Delete the last sentence. As reported in the hazardous constituent Site Investigation and as noted on the state's 10/12/00 errata sheet, trace concentrations of TCE and chloroform were detected in some groundwater samples. US Ecology has recommended augmented groundwater monitoring to confirm the presence of these constituents and evaluate trends *(Comprehensive Facility Investigation,* p. 4-3). It is also important to disclose that groundwater monitoring data from nearby USDOE operations indicate slightly elevated concentrations of TCE and chloroform. (15)

RESPONSE: The discussion on TCE and chloroform in groundwater has been corrected in the Final EIS. Any implication as to the source of the contaminants detected in the groundwater has been removed from the Final EIS.

197. COMMENT: Page 55, Section 2.5, US Ecology Site Investigation, Conclusions. The first sentence is misleading and should be deleted. Minute concentrations of RCRA constituents in soil gas within the buffer zone adjacent to disposal units are reasonably expected as a result of disposal practices prior to November 1985 and do not represent a threat to the environment. This is supported by the DEIS discussion of the state's chemical risk assessment (Section 4.1.3). (15)

RESPONSE: The US Ecology Site Investigation is discussed in Section 2.4.2 in the Final EIS. The Department of Ecology will conduct the 2004 MTCA Investigation to further evaluate current and future risk from hazardous substances at the commercial LLRW site.

198. COMMENT: Page 57, Section 2.5, US Ecology Site Investigation. Under "Conclusions", change first sentence to read "...radionuclides within the buffer zone beneath disposal units at the commercial..." It should also be noted that, per 10 CFR Part 61 and WAC equivalent, the point of compliance for site operations is the site boundary and the top of the saturated zone beneath the site. (15)

RESPONSE: Although the NRC has historically viewed the vadose zone as a buffer zone, DOH no longer refers to the vadose zone in this manner.

199. COMMENT: Page 133, Section 4.3.2, US Ecology Site Investigation. We suggest changing the second sentence of the first paragraph: "....indicate the presence of minute concentrations of hazardous substances and the potential for continued migration of small amounts of these substances from disposal units into the buffer zone adjacent to disposal units." We also suggest adding a sentence preceding the last sentence of the first paragraph: "As was the case with Phases 1 and 2 of the US Ecology Site Investigation, it is envisioned that work deemed necessary in Phase 3 will be paid for out of the existing site closure fund." (15)

RESPONSE: Discussion of the US Ecology Site Investigation has been extensively re-written throughout the Final EIS. At the time this response summary for the Draft EIS was written, decisions regarding specific funding the 2004 MTCA investigation were still pending.

7.3 MTCA Investigation

200. COMMENT: The EIS, at Page 3, improperly states, "no orders for remedial action apply..." As discussed elsewhere in these comments, MOTCA and RCRA requirements and the RCRA part B permit all require remediation following a more complete characterization and investigation of the now documented releases to groundwater that exceed MOTCA cleanup levels. (29)

RESPONSE: At this time there are no orders for remedial action at the commercial LLRW site.

201. COMMENT: The EIS must be modified to more thoroughly define the scope and timing of the Phase 3 Investigation. The EIS must also discuss how the results will be used to manage and remediate the site. (22)

RESPONSE: At the time of writing this responsiveness summary, the details of the 2004 MTCA investigation (Phase 3) were still in development.

202. COMMENT: Require a complete RCRA Facility Investigation and Corrective Measures Study, or the equivalent MOTCA Remedial Investigation/Feasibility Study, and MOTCA Site Hazard Assessment. The results of these investigations must be fully disclosed and considered in the EIS (i.e., nature and quantities of hazardous substances disposed, pathways for release, health impacts from each contaminant of concern....), and no decision on closure or relicensing made without these results. Characterization of the contamination from the resin tanks, designated by Ecology as extremely hazardous waste, must occur before the EIS is reissued and decisions are made on closure or licensing conditions. (29)

RESPONSE: The nature and extent of contamination of non-radionuclides will be further investigated in the 2004 MTCA investigation.

203. COMMENT: We support Washington Department of Ecology's and Washington Department of Health's recommendations to further characterize the Disposal Site for presence of non-radioactive hazardous contaminants and impacts on the environment. If contaminants of biological concern are detected during this assessment, we recommend that a biological effects assessment be conducted. (20)

RESPONSE: Results from the 2004 MTCA investigation will be used to conduct a risk assessment for non-radionuclides in accordance with WAC 173-340-357.

204. COMMENT: Require a thorough investigation and cleanup of the hazardous wastes leaking from the site. (49)

RESPONSE: Please see the response to Comment #202.

205. COMMENT: Why are we adding more wastes to a site that's leaking? It is unconscientious to talk about relicensing the site without first talking about investigating and cleaning these risks up. We need to have a full investigation and cleanup of the hazardous wastes that are now admitted to be leaking from this site before the site is relicensed. (29)

RESPONSE: Please see the response to Comment #182.

206. COMMENT: Require a full investigation and cleanup of the hazardous wastes leaking from the site before re-licensing. (43)

RESPONSE: Please see the response to Comment #182.

207. COMMENT: I ask, plead, beg, and threaten you to require a full investigation and cleanup of the hazardous waste leaking from the site before relicensing the site. (76)

RESPONSE: Please see the response to Comment #182.

208. COMMENT: On page 134, the EIS states, "agencies are coordinating their activities and are committed to ensuring the Phase 3 US Ecology Site Investigation does not adversely impact the closure schedule". The EIS should be rewritten to state that the agencies will ensure that any accelerated closure plans taken prior to the completion of the Site Investigation will not in any way preclude the need to take remedial actions to address the findings of the Investigations and the need to protect public health and the environment from toxic releases at these site. (22)

RESPONSE: The first phase construction of the cover and the 2004 MTCA Investigation (referred to as Phase 3 in your comment) will be coordinated to ensure that both the construction and the investigation can be completed on schedule.

8.0 PERFORMANCE ASSESSMENT

8.1 Cover Reliability

209. COMMENT: The likelihood of subsidence should be considered when the final cover is chosen. There is a lot of void space in the waste containers at the Richland facility, so subsidence is a reasonably anticipated event. (63)

RESPONSE: The state agrees that subsidence is a reasonably anticipated event. Subsidence impacts are briefly discussed in Section 4.4.1, Cover Design Reliability, in the Final EIS. It is impossible to predict the actual long-term maintenance that will be required for the final cover. However, certain cover characteristics are more amenable to maintenance, and some characteristics have been added to minimize future maintenance needs. In general, except for the Site Soils Cover, there is little difference between the cover designs in terms of long-term maintenance. The Perpetual Care and Maintenance Fund includes funds to repair the cover due to subsidence or other events.

210. COMMENT: If there is appreciable subsidence, multi-layered covers must fail. Reestablishment of a layered system after subsidence failure is a difficult undertaking and is exacerbated by the increasing complexity of the layered system. The failure potential of in-ground layered systems during the subsidence period argues for the development of an easily repairable surface barrier for use during that period (NUREG/CR 4918, Vol. 10, page 1 by Schulz et al). As an alternative to a multi-layered cover, US Ecology might consider a simpler design that will lend itself to remedial action following subsidence. To cite one example, DOE has been sponsoring research at Sandia on alternative covers for arid regions. Steven Dwyer is the Sandia project manager. Preliminary results were published in Civil Engineering about a year ago and they showed the "evaporative cover" to be promising for arid sites. The "evaporative cover" consists of little more than a thick soil cover. Presumably as subsidence takes place, the site operator would manage the subsidence by adding more soil and revegetating as needed. (63)

RESPONSE: The state agrees that there are benefits to a simple cover versus a multi-layered design. However, when all issues were considered, the GeoSynthetic Cover was identified as the preferred cover design. Even in failure, Geotextile Clay Liner (GCL) will equal or exceed the performance of an “evaporative cover” for preventing both water infiltration and radon emanation. Additionally, the GeoSynthetic Cover was determined to meet RCRA cover design requirements for hazardous waste.

211. COMMENT: Pg 85. Bentonite in this arid climate may crack and asphalt may do likewise. Therefore, it may not be reasonable for credit to be given for the barrier layers for retardation of gas emanation. Please discuss whether gas emanation has been shown to be enough of a problem to warrant attempts at control over that provided by the water infiltration barriers. (10)

RESPONSE: Radon is the primary dose contributor to the onsite intruder. Failure of both the asphalt and bentonite barriers was considered in the Radiological Risk Assessment (Appendix II). The unknowns concerning the performance of bentonite and asphalt in an arid climate were a factor in identifying the GeoSynthetic Cover as the preferred cover design.

8.2 Groundwater Model

212. COMMENT: This reviewer finds that the contaminant transport modeling of the groundwater and vadose zone, which was completed for the EIS and creates the basis of the risk predictions, is entirely inadequate. Problems with the model include the following:

- It uses a simplistic steady state rate of infiltration that does not account for massive snow melts or large precipitation events. Even if the steady state infiltration rate is conservatively high, it will not appropriately represent the driving force for the migration of contaminants.
- It uses a homogeneous representation of the vadose zone sediment and does not consider the true complex nature of the sediment or contaminant migration patterns.
- It is a simplistic, one-dimensional model with simple dispersion as the key distribution factor, of which both have been shown to clearly not represent actual site conditions. Even if a conservative one-dimensional model is used, it must be shown to be representative.
- The uncertainty of the model is too high for the time greater than I0,000 years.
- There is no basis for using the sorption coefficients that were selected, especially for plutonium and strontium.
- There is no calibration of the model of any sort with site data because the site data are inadequate for this purpose.
- The solubility limit of some radionuclides and specifically of uranium is too low. (5)

RESPONSE: The state agrees that contaminant transport modeling is inherently uncertain because models are designed to simplify complex natural environments. For this reason, the Final EIS states that the model results are hypothetical and are not meant to reflect actual future doses. The hypothetical doses are best used for a relative comparison of alternatives.

With these limitations in mind, a new model for radionuclide transport in the unsaturated zone was constructed for the Final EIS. Assumptions regarding sorption coefficients and solubility limits were revisited and modified accordingly. The recalibrated model used measured concentrations of Ni-63, Sr-90, Tc-99, Pu-239/240, and U-238 in the vadose zone to determine radionuclide release and transport rates. Predicted groundwater concentrations were both higher and lower compared to results in the Draft EIS.

213. COMMENT: A model predicting contaminant migration over a long period of time must be demonstrated to be correct by calibrating it with actual site data over a short time interval. As of the date of this review, no modeling has been completed at Hanford that is effectively calibrated or even demonstrated to represent site conditions. The modeling that was completed for this EIS is about the most simplistic model completed in recent times. This model has essentially been shown to be incorrect by the fact that several contaminants from the site have already reached groundwater. Because the model is the basis of the environmental risk assessment, this reviewer concludes that the identified and quantified risks in the EIS are incorrect, and disapproval of the proposed actions in the EIS is strongly recommended. (5)

RESPONSE: Please see the response to Comment #212.

214. COMMENT: The groundwater model is similar to the one used in tank farms that was shown to be totally inadequate. (5)

RESPONSE: It is not appropriate to compare the modeling at the commercial LLRW site with that of tank farms. The large volumes of liquids documented at tank farms created a very different environment for contaminant transport. Tank farms received an estimated 400,000 gallons of liquid wastes (ref. PNNL-11463 UC-702: *A Comprehensive Analysis of Contaminant Transport in the Vadose Zone Beneath Tank SX-109*; AL Ward, GW Gee, MD White, February 1997). Conversely, the commercial site was not licensed to receive free liquids in the trenches. Any unauthorized amount of free liquid that may have been disposed at the commercial site would be expected to be small.

215. COMMENT: Redo the contaminant transport modeling and risk assessment – after completion of the Phase 3 release investigation and site hazard assessment pursuant to MOTCA – to reflect actual data and mobilizing contaminants present. (29)

RESPONSE: The contaminant transport model and the Radiological Risk Assessment were revised to reflect radiological vadose zone data from the US Ecology Site Investigation. A risk assessment for non-radionuclides will be completed following the 2004 MTCA investigation.

216. COMMENT: Extensive technical comments, submitted on March 21, 2000, regarding the inadequacy of the groundwater model, appear to have been ignored. As a result, the accuracy of the draft EIS is in jeopardy. (22)

RESPONSE: We believe you are referring to comments on the groundwater model submitted by the Department of Ecology to DOH in March 2000. A subsequent meeting was held between the two agencies, and the issues regarding the groundwater model were resolved. The groundwater modeling used in the Draft and Final EIS reflects this resolution.

217. COMMENT: It appears you have not included the information you have concerning the groundwater in your assessments. I would expect that you would extend this process so you can include this new information. (79)

RESPONSE: The Final EIS schedule was extended so the radionuclide vadose zone data from the US Ecology Site Investigation could be incorporated into the groundwater model.

218. COMMENT: All the assumptions in the EIS are based upon a statement and a model that wastes couldn't reach groundwater for hundreds of years. The results of the investigation dispute this. The model doesn't work. (29)

RESPONSE: Please see the response to Comments #189 and #212.

219. COMMENT: When you talk about bringing in more of these wastes, how do you know if they're going to leach? (41)

RESPONSE: It is reasonable to assume that any waste disposal site will experience some leaching over a 10,000-year period. The modeling in the EIS was performed to predict how much leaching would take place, whether this leaching would result in unacceptable risk, and how this leaching could be minimized. Please see Appendix IV for a discussion of hypothetical leaching from the commercial LLRW site.

220. COMMENT: It would seem reasonable to assume that native vegetation would re-establish itself even on the site soils cover within 100 years. If this assumption is the basis for the 2 cm/yr recharge used in the model, it should be so stated. Also if infiltration rate is assumed to be the same as groundwater recharge, it should be so stated. (10)

RESPONSE: Yes, the model assumes that native vegetation is established on the site soils cover (the cover with a 20-millimeters per year infiltration rate). The infiltration rate predicted for each of the cover designs is the groundwater recharge rate for that cover for the first 500 years. After 500 years, the recharge rate for all cover designs reverts back to normal (5 millimeters per year).

Infiltration rates are discussed in Section 4.4.6.1, Cover Infiltration, in the Final EIS.

221. COMMENT: Why was 0.5 mm/year infiltration chosen rather than 0.1 mm/yr or less – what is the basis for the conservatism? (10)

RESPONSE: The 0.5-mm/year infiltration rate was selected to err on the side of overestimating impacts to groundwater versus underestimating. This was done to the inherent uncertainty in modeling. Please see a discussion of the infiltration rate selection in Appendix III of the Final EIS.

222. COMMENT: Page 86. Uranium-234 is conspicuously absent from consideration. It has a dose factor essentially the same as the other uranium isotopes and will typically be the same as or more than U-238 (by activity). (10)

RESPONSE: A new source term audit was completed for uranium at the site. As a result of this new source term, U-234 was included in the groundwater modeling.

223. COMMENT: The method for obtaining the gross beta should be discussed. Gross beta values less than the sum of the isotopic values need to be explained. (10)

RESPONSE: In the Draft EIS, gross beta for public health impacts in Section 4.0 was calculated, whereas gross beta in the Affected Environment Section was measured in the laboratory. Gross beta is always less than or equal to the sum of isotopic values consisting of the sum of gamma, plus gross beta, plus gross alpha.

224. COMMENT: I believe meaningful predictions of radioactive material migration are impossible, now and in the foreseeable future. This is because migration science is immature and it is impossible to obtain enough detailed geological description around radioactive disposal sites. (51)

RESPONSE: We agree that there are inherent uncertainties in modeling contaminant migration in both the vadose zone and in groundwater. Due to these uncertainties, the state will require secondary containment for future LLRW containing certain radionuclides, even though the modeling predicts that future doses will be within regulatory limits. These radionuclides are I-129, Tc-99, U-238, U-234, H-3, C-14, and Pu-239. Please also see response to Comment # 221.

8.3 Risk Assessment

225. COMMENT: Page 93 – The reader should be reminded that these (scenarios for predicting risk from radionuclides) are hypothetical and highly unlikely scenarios

requiring entry onto a presently restricted area. This applies for both the onsite and offsite scenarios given in this EIS. (10)

RESPONSE: The hypothetical nature of the scenarios has been emphasized in the Final EIS. Institutional controls are discussed in Section 4.4.3, Institutional Controls, in the Final EIS.

226. COMMENT: Page 100 – We strongly recommend that the Chemical Risk Assessment be redone using the data from the US Ecology Site Investigation. (10)

RESPONSE: The data from the US Ecology Site Investigation is not complete enough to perform a risk assessment. Results from the 2004 MTCA investigation at the commercial LLRW site will be used to conduct a quantitative risk assessment for non-radionuclides in accordance with WAC 173-340-357.

227. COMMENT: The levels of the leaked wastes in the groundwater exceed our state cancer risk standards, and there is no discussion of these risks in the EIS or how we are going to clean up these chemicals. (29)

RESPONSE: The risk standards in MTCA will not be applied to non-radioactive hazardous substances and the dose standards in Chapter 246-250 will be applied to radionuclides. The impacts of radionuclides are discussed in Chapter 4.0, Public Health. Impacts from non-radionuclides will be quantified following the 2004 MTCA Investigation. Also, please see the response to Comment #226.

228. COMMENT: The presence of TCE was not taken into account in the risk assessment. (5)

RESPONSE: In the Chemical Risk Assessment (Kirner 1999), trichloroethene (TCE) was assumed to be present in groundwater, although its concentration was estimated to be under a risk-based concern. However, the Chemical Risk Assessment citied in the Draft EIS was preliminary and did not consider results from the US Ecology Site Investigation. The Department of Ecology is planning the 2004 MTCA investigation to collect sufficient data to perform a risk assessment for non-radioactive substances in accordance with MTCA.

229. COMMENT: Page 101, Section 4.1.3, Risk from Non-Radioactive Hazardous Waste. Delete the third sentence of the last paragraph and replace it with: "For groundwater, only vinyl chloride has a calculated exposure point concentration (EPC) which exceeds its risk based concentration (RBC). Since numerous conservative assumptions went into calculating the EPC, the resultant value significantly overestimates the actual, maximum EPC (Kirner 1999)." (15)

RESPONSE: The statement you refer to is from the Chemical Risk Assessment (Kirner 1999) discussed in the Draft EIS. This report is recognized as being

preliminary, and specific conclusions from that report have been deleted from the Final EIS. The Department of Ecology will conduct a quantitative risk assessment on non-radionuclide hazardous substances following the 2004 MTCA investigation.

230. COMMENT: Page 89 – It appears that the "Offsite General Population" scenario is placed adjacent to the commercial LLRW disposal site for evaluation of normal operations and anticipated performance of the site in the long term. This is in conflict with standard practice of placing the populations off the Hanford Site for such evaluations and evaluating the unplanned onsite scenarios separately. It also appears to conflict with the intent of WAC 246-221-070 regarding unrestricted areas and could lead to unrealistic conclusions. (10)

RESPONSE: NRC guidance requires the offsite person to be at the fence line of the commercial LLRW site boundary. However, the state realizes that hypothetical impacts from the commercial LLRW site are best presented in the context of the surrounding 586-square mile Hanford Site. The commercial LLRW site is a 100-acre site in the middle of the much larger contaminated central plateau area of Hanford. USDOE has designated the central plateau for Industrial-Exclusive use in the final Hanford comprehensive Land Use Plan (CLUP) EIS (USDOE 1999). It is likely that waste management activities, other than the commercial site, would make the entire central plateau unfit for residential use or other long-term uses for an indefinite period. USDOE is planning to use institutional controls to restrict public access to the central plateau for the foreseeable future. It will be every future generation's responsibility to ensure that these controls remain in place for as long as necessary.

231. COMMENT: Page 89 – This section should be expanded to include the most likely scenario that there are no intrusions of individuals onto the Hanford Site, and thus none onto the commercial site. (10)

RESPONSE: An intruder analysis is required by state and NRC regulations for closing a commercial LLRW site. Please see response to Comment #230.

232. COMMENT: Pg. 83. We have been unable to locate where the likelihood that an individual will live on or near the commercial site is addressed. (10)

RESPONSE: The likelihood of someone living on the site within the 10,000-year post-closure period is unknown.

233. COMMENT: The DEIS does not take into account the additional cancer risk for Native American children living along the Columbia. (77)

RESPONSE: The Final EIS includes a lifestyle scenario for a Native American living along the Columbia River. Please see Section 4.4, Post-Closure Radiological Dose, in the Final EIS.

234. COMMENT: Long-term public health impacts should present the inevitable, namely the migration of radionuclides to the Columbia River and what, if any significant contribution it might make to the individual and collective dose to the public. (10) (37)

RESPONSE: A Native American River Resident Scenario has been added to the Final EIS. Dose projections range from 4 to 5 millirem per year for the child, and 9 to 11 millirem per year for the adult. Please see the response to Comment #233.

235. COMMENT: Page 5 states that license renewal is for 5 years but the analyzed doses are for operations for 56 years or 11 renewal cycles. Wouldn't the incremental dose increase be 1/11 of the values listed in the tables, based on a single renewal? This comment applies to similar analyses throughout the document. (10)

RESPONSE: The impacts of the license alternatives have been evaluated both for the five-year renewal period and for the maximum operating period (2056). There is little or no contribution to the maximum hypothetical post-closure dose from continuing to operate the commercial LLRW site for the five-year renewal period, nor for the maximum operating period.

236. COMMENT: For perspective, all of the covers yield doses of about 10% or less of that from natural background radiation. How important can this all be? (10)

RESPONSE: The importance of these contributions is considered in terms of the regulatory requirements.

237. COMMENT: To enhance public understanding, we suggest noting that approximately 80% of the maximum hypothetical doses in the Draft EIS are associated with material that has already been disposed of. (15)

RESPONSE: If the site is operated for the next 50 years using the three identified preferred alternatives: (1) Renew License; (2) 100,000 cubic feet of diffuse NARM; and (3) GeoSynthetic Cover/Close-As-You-Go Schedule, the waste disposed after 2005 will have little or no impact on the hypothetical maximum post-closure doses. This point has been clarified in Section 4.4, Post-Closure Radiological Dose, in the Final EIS.

238. COMMENT: Page 93-94, Section 4.1.2.3.1, Dose Assessment. Delete the paragraph beginning at the bottom of Page 93 in the DEIS. As written, the paragraph implies that the doses presented in Table 18b are actual expected doses rather than hypothetical maximum, analytically derived values developed for the purpose of qualitative alternative comparison. Alternatively, language such as that contained in the paragraph on the top of page 99 of Appendix II would provide useful perspective. (15)

RESPONSE: The Final EIS has been revised to emphasize the hypothetical and comparative nature of the predicted doses, rather than the quantitative value of those doses.

239. COMMENT: Most closure regulation/guidance is based on 1,000 years, not 10,000 years. It is extremely difficult to predict barrier performance and doses beyond 1000 years, and small differences in Kd's and infiltration rates can have a major impact on >1000 year dose calculations. We suggest that maximum doses for first 1000 years also be presented (as they are in various tables in Appendix II), and a clear discussion of >1000 year estimating uncertainties be included. (15)

RESPONSE: The Final EIS includes doses for zero to 1,000 years, and 1000 to 10,000 years. The uncertainty analysis predicted that: (1) uncertainty of the predicted doses increases, the longer the time-period after closure; and (2) the single-point dose estimates may not represent the maximally exposed individual as intended. For example, at 1,000 years, the Radiological Risk Assessment (Appendix II) predicted a hypothetical single-point offsite dose of 2 millirem per year, and the 95% level in the uncertainty analysis predicted 17 millirem per year. At 10,000 years, the hypothetical single-point offsite dose was predicted to be 6 millirem per year, and the 95% level in the uncertainty analysis predicted 65 millirem per year. The uncertainty analysis is discussed in Appendix II and Section 4.4, Post-Closure Radiological Dose, in the Final EIS.

240. COMMENT: The Draft EIS did not include all health risks, but it assures us that only 3 percent of the Native American children would die from this and that is unacceptable. (79)

RESPONSE: The 3% risk quoted is from the onsite intruder alternative that assumes no engineered cover will be placed on the commercial LLRW site. This alternative was included to provide a comparison between different cover designs and was not identified as the preferred cover design in the Final EIS. The introductory paragraph of Section 4.1.2.4 of the Draft EIS explains that due to the uncertainties associated with risk assessment, the risk predictions in the EIS are used only to compare relative risks of the alternatives, and should not be considered an assessment of actual risk. This statement is also included in the Final EIS in Section 4.4, Post-Closure Radiological Dose.

241. COMMENT: The DEIS abdicates the state's humanitarian and treaty responsibilities by effectively accepting certain increased cancer rates to be born by Native Americans. The DEIS is not worthy of the state of Washington citizens and is not in their interest. Governor Locke and the departments of Health and Ecology need to rewrite this one. (19)

RESPONSE: Hypothetical offsite cancer risks are predicted to be higher for Native Americans as compared to the general population. This disparity is primarily due to the presumed daily use of sweat lodges by the Native Americans. As stated in the Final EIS, risk assessments are not meant to convey an actual future risk. These assessments are included only for use as a comparison of relative risks between alternatives.

Hypothetical impacts from the commercial LLRW site are best presented in the context of the surrounding 586-square mile Hanford Site. The commercial site is a 100-acre site in the middle of the much larger contaminated central plateau area of Hanford. USDOE has designated the central plateau for Industrial-Exclusive use in the final Hanford comprehensive Land Use Plan (CLUP) EIS (USDOE 1999). It is likely that waste management activities, other than the commercial site, would make the entire central plateau unfit for residential use or other long-term uses for an indefinite period. In this context, hypothetical impacts from the commercial site would contribute little, if any, to the overall impact on public health. USDOE is planning to use institutional controls to restrict public access to the central plateau for the foreseeable future. It will be every future generation's responsibility to ensure that these controls remain in place for as long as necessary.

242. COMMENT: Page 100, Section 4.1.2.4, Significant Unavoidable Adverse Impacts (re: Cancer Risk). We suggest amending the last sentence to reflect analysis contained in Appendix 11, Chapter 10: "...combinations are predicted to slightly increase the risk....." The most likely cancer risk from offsite exposure from the site is less than one in one million. The most likely cancer risk predicted for the hypothetical onsite intruder is approximately one in 500,000 (Appendix 11 @ p. 97 & 100). (15)

RESPONSE: The uncertainty analysis is discussed in Section 4.4.7.2.4, Uncertainty Analysis, in the Final EIS.

243. COMMENT: There are no significant unmitigated impacts of the proposed project or alternatives, given the conservative approach taken by the state to transport modeling, surrounding land use and residence and dose uptake assumptions. Within the scientific community there is honest debate regarding biological impacts (or lack thereof) at extremely low levels of radiation. The numerical values stated, even if accepted as valid, are well below values known to cause harm. These values are within the range that many radiation safety professionals believe to be biologically insignificant. For instance, in a 1996 position statement, the Health Physics Society stated, "…for a population in which all individuals receive lifetime doses of less than 10 rem above background, collective dose is a highly speculative and uncertain measure of risk and should not (emphasis added) be quantified for the purposes of estimating population health risks." (HPS 1996, attached). Any combination of scenarios

projected to have regulatory significance (e.g. exceed the 25 mrem off site standard) can be adequately mitigated as stated in the DEIS. (15)

RESPONSE: Thank you for your comment.

244. COMMENT: The dose calculation models are very conservative models and they greatly overestimate the hazards that exist in reality. In addition, the linear no threshold model used for assessing risk is also very conservative. For every study indicating there is a health risk from radiation, there is another study indicating there is no health risk at all. The April 1995 Health Physics Society's position statement on risk assessment indicates there is no risk from radiation at low dose rates. (21)

RESPONSE: DOH acknowledges that there are different opinions on the risk of radiation and the use of the linear no threshold (LNT) model. However, the National Council on Radiation Protection and Measurements (NCRP) recently conducted a significant review of the dose response data and concluded that the linear no threshold model is the most appropriate model, given the data currently available.

245. COMMENT: Poorly quantified inventories plus excessive conservatism results in some alternatives exceeding regulatory limits. Actually, the results may be far less than the limits. The probability estimates of the appended material helps but is not brought forward, and is likely to be unnoticed by most readers. The absence of uncertainty analysis in the inventories of Tc-99 and I-129 seriously detracts from the utility of the uncertainty analysis. (10)

RESPONSE: The uncertainty analyses in Appendix II predicted that the offsite dose would increase, not decrease, for the maximally exposed individual (MEI), the longer the time period following closure. Please see Section 4.4, Post-Closure Radiological Dose, in the Final EIS.

246. COMMENT: Page 93 – This paragraph states that the air pathway includes the air inside the home for Table 18b. The 3rd paragraph implies indoor radon is the primary source of ambient indoor dose. Footnote 40 states the Maximum Ambient Onsite Air Dose in Table 16 does not include indoor Radon. This appears to cause an inconsistency in determining the onsite dose. Please clarify the inconsistency. Also a reference is needed for the 15 mrem/yr DOH guidance for Hanford. (10)

RESPONSE: In the Final EIS, the information in Table 16 of the Draft EIS was deleted to avoid confusion. The maximum ambient onsite air dose in Table 16 was calculated to specifically show compliance with the requirements of WAC 246-247. This air emissions requirement specifies that outdoor radon must be considered, but does not include the contribution from indoor radon. The Radiological Risk Assessment numbers shown in Table 18 of the Draft EIS

included indoor radon for the resident intruder. These risk levels can be found in Table 4.J: Lifetime Hypothetical Risk for Individuals, in the Final EIS.

9.0 AFFECTED ENVIRONMENT

9.1 Earth

247. COMMENT: Page 104 – What is the basis of the following conclusions? "Minor fluctuation in soil radionuclide levels and worldwide fall-out levels." Statements like this and elsewhere in the document are usually source-referenced. (10)

RESPONSE: This sentence has been deleted from the Final EIS. However, the Cs-137 resource utilized was NCRP Report No. 94 (issued December 30, 1987).

9.2 Water

248. COMMENT: On page 106 of the Draft EIS, it states that the groundwater standards can be used as an indicator of environmental impacts. This reviewer is not familiar with the logic of this statement and it must be explained further. Current groundwater contaminant concentrations, whether or not they are correctly reported in the EIS, can only be used to predict future environmental impacts if there is a trend in the data that can be used to calibrate a contaminant migration model. The current level of contaminants relative to the groundwater standards is only an indicator of current environmental impacts. The purpose of the EIS should be to attempt to predict what will happen in the future. A comparison of the current contaminant levels only serves to bias the EIS by suggesting there will be no problem in the future. (5)

RESPONSE: Existing groundwater concentrations were used in the Draft and Final EIS to indicate existing environmental conditions. The groundwater model was used to predict future impacts. The Ground Water Standards were used as a reference point for both current and predicted future impacts to the groundwater. Please see Section 5.2, Water, in the Final EIS.

249. COMMENT: – Include a discussion of Cold Creek and Dry Creek as surface water bodies. Also in 200 East, groundwater is used from 2 wells for emergency cooling of tanks and fire suppression. (10)

RESPONSE: A brief mention of Cold Creek was added to Section 5.2, Water, and Section 6.3, Catastrophic Events, in the Final EIS.

250. COMMENT: Page 108 – This paragraph appears to contradict the 3rd paragraph on page 107. It is stated here "it is not possible to determine from the data if the commercial LLRW disposal site is contributing to the groundwater concentrations." This includes tritium (H-3). The previous paragraph stated the

"increases in tritium and gross beta have been attributed to USDOE activities elsewhere at Hanford." (10)

RESPONSE: The data show that H-3 groundwater concentrations are higher upgradient of the commercial LLRW site. This does not preclude the possibility that the commercial LLRW site is also contributing to the H-3 concentrations.

251. COMMENT: Pg 12. It is not clear how 216 pCi/L is an increase of 36 pCi/L over the pending action (101 to 220 pCi/L). (10)

RESPONSE: This confusing statement has been deleted from the Final EIS.

252. COMMENT: Page 110., Significant Unavoidable Adverse Impacts (re: groundwater). We suggest changing the response to "None". Actual on-going monitoring data indicate that groundwater quality has been maintained. The conclusion that the 50 pCi/L gross beta standard will be exceeded sometime in the future is based on pathway analysis employing highly conservative assumptions. These conservative parametric values as well as the over representation of Tc-99, discussed on p. 109, provide a sufficient basis to question the hypothetical projection of gross beta concentrations in excess of state groundwater quality standards. (15)

RESPONSE: The state agrees that the predictions for gross beta were too hypothetical and should not be used to determine future compliance with the regulatory standard of 50 pCi/L. The Final EIS has removed the discussion on gross beta in favor of a discussion on the concentrations of individual radionuclides. Please see Section 5.2, Water, in the Final EIS.

253. COMMENT: The threat of radioactivity from Hanford endangering the quality of drinking water for the Portland area has existed for many years. I am deeply concerned about Portland's Bull Run water supply. The problem is a lack of public information concerning this risk. Please help promote public information about the additional risk that will result from importing radioactive wastes from elsewhere. (62)

RESPONSE: Thank you for your comment.

254. COMMENT: Page 109, Section 4.2.2.3, fourth paragraph. We suggest it be noted that because of attenuation, diffusion, dispersion and radioactive decay, predicted groundwater concentrations of radionuclides presented in Table 14 (page 87) will dissipate several orders of magnitude before potentially reaching a surface water outlet at the Columbia River. Further, according to USDOE, contributions from the commercial LLRW facility would be "minimal" (DEIS p. 129) in comparison to those from DOE sources. (15)

RESPONSE: The predicted dose to a Native American adult living on the Columbia ranges from 9 to 11 millirem per year. The Radiological Risk Assessment (Appendix II) does not take credit for any attenuation, diffusion, or dispersion during the time the groundwater travels to the Columbia River. The assessment does assume a 53% dilution from bank storage before the groundwater enters the Columbia River. This dilution is accounted for in the hypothetical doses to the Native Americans living next to the river. Please see Section 4.4, Post-Closure Radiological Dose, in the Final EIS.

255. COMMENT: Consider the impacts of groundwater migration from the site to the Columbia River, cumulative impacts from all contaminated groundwater seepage along the River, and do the ecological risk assessment required for a hazardous substance release site. (29)

RESPONSE: Impacts to persons living on the Columbia River have been included in the Final EIS. An ecological risk assessment for hazardous substances will be completed following the 2004 MTCA investigation. Please see the response to Comment #254.

9.3 Air Quality

256. COMMENT: Page 111 – The discussion on air monitoring data cites an increase; however, data for only one year are given. (10)

RESPONSE: Air quality data from 1998 and 2001 are used in the Final EIS. Please see Table 5.E: Airborne Radionuclide Concentrations.

257. COMMENT: Page 111 – Presume the source of 60-day half-life of I-125 is medical sources, but it would help to identify. How is it that it is around to monitor? (10)

RESPONSE: I-125 is only monitored during offloading of certain waste shipments, for worker safety. Because of its short half-life, I-125 data have been removed from the discussion of the existing air quality.

258. COMMENT: Page 111 – This section needs to include consideration of impacts on air quality from borrow pits and other areas where cover materials will be removed, as well as materials blowing off trucks during transportation of cover materials to the US Ecology site. (10)

RESPONSE: A brief discussion of air quality impacts associated with borrow site activity and transportation of cover materials is included in Section 5.3, Air Quality, in the Final EIS.

9.4 Ecology

259. COMMENT: We concluded that the analysis lacks sufficient details to determine impacts to fish and wildlife and their habitat. From information provided in the document, radionuclides and hazardous organic substances have been detected in the groundwater beneath the Disposal Site, and the origin of these contaminants may be from the Disposal Site. Of those contaminants, trichloroethene (TCE) is known to be toxic to aquatic organisms, and several of the radionuclides detected have extremely long half-lives. We know that some contaminants originating from U.S. Department of Energy (USDOE) waste management operations on the Central Plateau have reached groundwater and migrated to the Columbia River. Although the Disposal Site is more than a few miles from the river, without any corrective actions, these contaminants would be expected to reach the river. The EIS needs to provide an analysis of expected travel time for the detected contaminants to reach the Columbia River. (20)

RESPONSE: Results from the 2004 MTCA investigation will be used to conduct a quantitative ecological risk assessment in accordance with WAC 173-340-357, and if triggered, a terrestrial ecological evaluation pursuant to WAC 173-340-749.

260. COMMENT: I request that a thorough analysis be done for impacts to every species of animals, insects, fish and plants of all these hazardous wastes. This should be projected for the entire life of each substance in the facility, and substances proposed to be disposed. Each species of the above must be identified and documented through all migration/seasons. Discuss what mutations and weaknesses will occur when the species leave the site, defecate, reproduce, and mate with others outside the site. (79)

RESPONSE: Please see the response to Comment #259.

261. COMMENT: WDFW has concerns about potential biological impacts related to closure activities. The closure analysis fails to identify potential source locations of geologic resources that will be needed to construct a protective barrier. In addition, it fails to bound the volume of geologic materials required, or potential impacts that may occur to biological resources at locations where the resources would be extracted. Early on, we were led to believe by Ecology staff involved with this action, that the soils for constructing the barrier would come from the Disposal Site, but that information is not presented anywhere in the document. Since the document is lacking in details, we are requesting additional information on this issue to determine appropriate wildlife mitigation measures regarding this action. Finally, the closure analysis limits soil materials to the use of silt loam when a study conducted by USDOE determined that fine sandy loam is also suitable for constructing protective barriers. We believe the project needs to analyze this as well. (20)

RESPONSE: The Final EIS clarifies that certain cover materials, including silt loam and gravel, are not available onsite. The preferred method of obtaining these cover materials is from an established offsite vendor. Any vendor will need to comply with all state regulations, including SEPA. If a vendor is not available at the time of construction, a borrow site will most likely be developed at an offsite location for these materials. The need for an offsite location is speculative at this time; thus the EIS does not address potential environmental or health impacts of developing an offsite borrow area.

Some site soils may need to be excavated from the undisturbed 15 acres in the northwest corner of the commercial LLRW site. The impacts of this excavation have been included in the Final EIS, Section 5.4, Biological and Ecological Resources. Finally, the suitability of sandy loam soils in place of silt loam soil will be evaluated during the engineering design phase.

262. COMMENT: Page 112 – This section should consider the impacts on the State priority habitat shrub-steppe if “site sands” for cover materials are obtained locally. Habitat destruction at other cover material sites should also be considered. Mitigation measures for the borrow sites need to be discussed. (10)

RESPONSE: Although much of the site sands will be obtained from the trench area, it may be necessary to excavate soils from the undisturbed 15 acres in the northwest corner. The amount of excavation will depend on how long the site continues to operate, and future waste volumes. A discussion of impacts to the shrub-steppe habitat in the northwest 15 acres has been added to Section 5.4, Biological & Ecological Impacts, in the Final EIS.

263. COMMENT: Arbitrary restriction of future development on the 15 acres may adversely affect future operational flexibility. Such adverse effects may restrict the best practices and application of ALARA principles during operation and/or negatively affect the economical use of available land, to the detriment of facility rate-payers.

Page 115, Mitigation Measures. Delete bullet: "Protect undisturbed 15 acres in northwest corner of site during operations and closure." The affected habitat is not a unique resource, and the size of the proposed mitigation area is insignificant compared to the overall regional shrub-steppe habitat on the Hanford Reservation. Mitigation of this temporary, insignificant impact will also be fully provided by closure and stabilization of all disposal units and reestablishment of vegetation. The DEIS recognizes (p. 115) that most cover designs considered "are expected to encourage the shrub-steppe habitat to eventually return and most likely thrive due to the silt loam soil in the covers." In summary, any adverse impacts will be fully mitigated by proper closure and stabilization of disturbed areas at the site, as contemplated in the Site Closure and Stabilization Plan. (15)

RESPONSE: Mitigation for the 15 acres has been rewritten as follows: "Prior to excavation, conduct a biological survey on the northwest 15 acres to minimize potential impacts and to determine the correct mitigation ratio." The state supports minimizing adverse impacts to undisturbed habitat, regardless of the size of the area.

9.5 Cultural Resources

264. COMMENT: The EIS fails to consider the cultural and natural resources and the protection of the ecology and the ecosystem. (8)

RESPONSE: The EIS contains sections on ecological and cultural resources. Please see Section 5.4, Biological & Ecological Impacts, and Section 6.1, Cultural Resources, of the Final EIS.

265. COMMENT: The proposed actions constitute a federal undertaking as defined under the National Historic Preservation Act (NHPA) Section 301, and will need to have a cultural resource review completed to identify and evaluate impacts to all cultural resources on the Hanford Site, as required under NHPA Section 106. (10)

RESPONSE: A cultural review pursuant to Section 301 was completed on October 14, 1997. Copies of this review were sent to USDOE at the time.

266. COMMENT: The definition of Cultural Resources on page 139 is inaccurate. Please use the definition from the Hanford Cultural Resource Management Plan. (10)

RESPONSE: The definition has been deleted from the Final EIS.

267. COMMENT: Section 4.2.5 only discusses cultural resources important to Tribes. A cultural resource review is needed to identify and assess impacts on all types of resources, such as Anti-Aircraft Sites and Plutonium production facilities near the site. It is very probable that the review will find no impact to cultural resources. (10)

RESPONSE: The cultural resource review completed in October 1997 found no artifacts meeting the criteria of the National Register of Historic Places. Based on this review, Native American cultural resources were determined to be the primary cultural resource on the commercial LLRW site.

268. COMMENT: The reference to Harper 1998 should be used with caution. The statement may not represent all the Tribes who have cultural and religious ties to the Hanford Site. Harper's views are representative of the Yakama Nation. The other Tribes also include the Nez Pearce, Confederated Tribes of Umatilla Indian Reservation, Wanapum Band, and the Colville Tribe. (10)

RESPONSE: Where appropriate, “tribes” has been replaced with “Native American” throughout the Final EIS.

269. COMMENT: Not all Tribes that occupied the Hanford Area are Treaty Tribes; therefore change the reference to Tribal nations to Native Americans. (10)

RESPONSE: This change has been made in the Final EIS.

270. COMMENT: There is no discussion about how impacts to cultural resources have been determined in Section 4.2.5.1. Impacts to Cultural Resources on the Hanford Site must concur with the Hanford Site Preservation Officer. (10)

RESPONSE: Impacts to cultural resources were evaluated using the 1997 PNNL Cultural Resource Review.

271. COMMENT: Please summarize any consultation the DOH may have completed with Tribes, Public, Federal Agencies, or other interested parties as it relates to Historic Properties. (10)

RESPONSE: DOH held three public scoping meetings. No comments were received pertaining to historic properties at these meetings. DOH also met with the USDOE National Environmental Policy Act (NEPA) personnel early in the process. No comments or issues were presented by USDOE on cultural resources at that time, nor during any subsequent discussions. DOH met with the Yakama Nation, the Nez Pearce Tribe, and the Confederated Tribes of the Umatilla Indian Reservation on numerous occasions. Cultural resources were discussed at most of these meetings. DOH notified the State Historic Preservation Officer (SHPO) in writing, and offered to meet to discuss historic properties. No response was received from the SHPO. DOH also consulted three different cultural resource review documents specific to the commercial disposal site.

272. COMMENT: Please remove references to the future Native American traditional use of sweat lodges. The area was not traditionally used for sweat lodges. The USDOE will not allow or approve of the building of sweat lodges or traditional gathering on or near a landfill. (10)

RESPONSE: The state included daily sweat lodge use in the hypothetical Native American adult lifestyle scenarios after consultation with several tribes. The state decided not to dispute the hypothetical scenarios provided by the tribes.

273. COMMENT: Pg 116. Your reference to PNNL 1997 is not a cultural resources survey of the commercial LLRW disposal site. It is a survey of five sand dunes about 1.5 miles south of the US Ecology Site that were being considered for cover material. (10)

RESPONSE: The wrong document number was included in the reference list. The correct document number for PNNL 1997 is HCRC #98-600-001. We apologize for the confusion.

274. COMMENT: All closure cap designs will rise 13 feet above the current land grade. Should this change in topography be analyzed as part of cultural resources or ecology? (10)

RESPONSE: Neither the tribes nor the Washington Department of Fish and Wildlife submitted comments pertaining to cultural or biological impacts due to the height of the cover. Based on this, the state did not include a discussion of this type of potential impacts in the Final EIS.

275. COMMENT: Page 116 – This section also needs to address the impacts on cultural resources of obtaining closure materials. (10)

RESPONSE: The state is planning to obtain the majority of cover materials from an offsite vendor. SEPA requirements will be addressed at the time of procurement.

276. COMMENT: Page 116, Section 4.2.5.1, Impacts of License Renewal: License renewal or denial will have no significant impact on tribal cultural resources. The US Ecology facility is on federal government property that will remain so for at least the next 50 years (DOE/EIS-0222-F). We suggest replacing the first paragraph as follows: "Relicensing will have no impact potential on tribal land uses, since such land uses could only occur after site closure, natural surface habitat restoration, and termination of institutional control by the state." (15)

RESPONSE: The presence of the commercial LLRW site has and will continue to have an impact on the Native American cultural value placed on a pristine environment. The proposed actions are expected to neither lessen nor increase this existing impact.

9.6 Land Use

277. COMMENT: Page 131 – The sentence on the Monument is inadequate and should be expanded. A map should be provided to show the distant relationship to the commercial site. A statement that the implications of the Monument on the Hanford Site are under study would probably be useful. (10)

RESPONSE: Additional information on the Hanford National Monument has been included in Section 6.2, Land Use, in the Final EIS.

278. COMMENT: Pg. 83. More needs to be made of the location of the commercial site within the Hanford Site and its relation to USDOE's Comprehensive Land-Use Plan EIS (CLUP). (10)

RESPONSE: The Final EIS emphasizes that hypothetical impacts from the commercial LLRW site are best presented in the context of the surrounding 586-square mile Hanford Site. The commercial site is a 100-acre site in the middle of the much larger contaminated central plateau area of Hanford. USDOE has designated the central plateau for Industrial-Exclusive use in the final Hanford CLUP EIS (USDOE 1999). It is likely that waste management activities, other than the commercial site, would make the entire central plateau unfit for residential use or other long-term uses for an indefinite period. In this context, hypothetical impacts from the commercial site would contribute little, if any, to the overall impact on public health. USDOE is planning to use institutional controls to restrict public access to the central plateau for the foreseeable future. It will be every future generation's responsibility to ensure that these controls remain in place for as long as necessary. Please also see Section 4.4.3, Institutional Controls, in the Final EIS.

279. COMMENT: Page 41, Section 2.0, Background. A discussion is essential, describing USDOE's plans for future land use in the 200 area, as publicly disclosed in its recently issued Comprehensive Land Use Plan. This is critical to realistic assessment of traditional tribal or alternative land usage patterns in the foreseeable future. Specifically, add the following from DOE/EIS-0222-F: "This Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement (HCP-EIS) considers several land uses for the Hanford Site planned for the next 50 years (p. 1-1)," and "Lands within the central plateau geographic area would continue to be used for the management of radioactive and hazardous waste materials. These management activities would include the collection and disposal of radioactive and/or hazardous waste materials that remain onsite, contaminated groundwater management, current offsite commitments, and other related and compatible uses." (p.3-15 and elsewhere) (15)

RESPONSE: The CLUP wording has been included in Section 6.2, Land Use, in the Final EIS. Please see the response to Comment #278.

9.7 Catastrophic Events

280. COMMENT: This section should discuss Yakima River flooding. (10)

RESPONSE: The Yakima River follows a small part of the southern boundary of the Hanford Site. The closest portion of the Yakima River is approximately 13 miles southeast of the site. Based on historic flood flows, a flood on the Yakima River is not expected to impact the commercial LLRW site. This information has been included in Section 6.3, Catastrophic Events, in the Final EIS.

281. COMMENT: We suggest updating this section to note that the summer 2000 fire did not result in known radiological releases from US Ecology or USDOE facilities. (15)

RESPONSE: Section 6.3 of the Final EIS, Catastrophic Events, has been updated to include the 2000 fire.

282. COMMENT: Update this section with the two reports that will be provided on the 24 Command Fire. (10)

RESPONSE: Please see the response to Comment #281.

283. COMMENT: Remove the "Local Ponding" discussion from the "Catastrophic Events" discussion. Local ponding is not a catastrophic event. Impacts can be easily anticipated and mitigated through existing facility operating procedures. Change Table 28 accordingly. (15)

RESPONSE: Although ponding is not normally considered a catastrophic event, it occurred due to a unique set of severe weather conditions and was not anticipated or mitigated at the time.

10.0 OTHER CONSIDERATIONS

10.1 Socioeconomic

284. COMMENT: We believe the discussion of socioeconomic impacts of the License Renewal No Action Alternative are understated in terms of the disruption of business activities in waste generation sectors, including industrial, medical, research, and power generation. Admittedly, these impacts are much more difficult to quantify than specific impacts such as the dollar amounts related to taxes and surcharges. Nonetheless, the very brief summaries on pages 17 and 127 could be expanded to more fully describe the probable impacts of license denial. This expanded discussion should acknowledge impacts throughout the compact region, not just Washington State. In that manner, the DEIS would more closely align with the expectation that environmental issues be considered from a broad perspective (RCW 43.21C.030). (7)

RESPONSE: The discussion on impacts to the business community was expanded in the Final EIS to include impacts on generators throughout the region. The state recognizes that there are out-of-state impacts associated with several alternatives; however, a comprehensive evaluation of out-of-state impacts is beyond the scope of this EIS. Please see Section 6.5, Socioeconomics, of the Final EIS.

285. COMMENT: The commercial disposal site actually employs 28 people, not 24. (78)

RESPONSE: The correction has been made in the Final EIS.

286. COMMENT: Waste surcharges on the commercial LLRW disposal site prove a direct benefit to the region by providing revenue to the Hanford Economic Development fund that is used to stimulate the local economy. (16) (13)

RESPONSE: Thank you for your comment.

287. COMMENT: The HAEIF Investment Plan Committee unanimously passed a resolution supporting the renewal of the US Ecology license. The US Ecology site has contributed approximated $5 million to HAEIF, resulting in over 500 new jobs. It's crucial that this economic development effort continue.

Notable benefits of the site include:

- Lease payments to Benton County
- Consistent fees for generators
- Support of Tri-Cities economic diversity (27) (33)

RESPONSE: Thank you for your comment.

288. COMMENT: The commercial LLRW Site is an important component of the economic infrastructure in the Tri-Cities. Without the facility, millions of dollars in funding would be lost to local area. (34)

RESPONSE: Thank you for your comment.

289. COMMENT: The site is an important component of the economic infrastructure of the Tri-Cities. (31)

RESPONSE: Thank you for your comment.

290. COMMENT: A primary benefit of the site is that fees for the disposal of LLRW can be maintained at a reasonable and fairly consistent level for generators. (3)

RESPONSE: Thank you for your comment.

291. COMMENT: The commercial site provides a benefit to local economy through surcharges ($14 million to the county and $25 million to the HAEIF), diversity of employment and attraction of industry to the area. (3)

RESPONSE: Thank you for your comment.

292. COMMENT: The longer the site operates, the larger the PC and M Fund. (3)

RESPONSE: Thank you for your comment.

293. COMMENT: The operation of the site is a burden to the communities of Benton County. The surcharges on the waste are too low, considering the long-term

negative impact of the site on the area. The surcharges should be increased and reallocated among all the general purpose governments in Benton County. (3)

RESPONSE: Thank you for your comment.

294. COMMENT: This site is an important component of the economic infrastructure of the Tri-Cities area. It will provide approximately $14 million to the county and $25 million to the HAEIF over the next 50 years. (35)

RESPONSE: Thank you for your comment.

295. COMMENT: Closing the site will result in loss of local revenue, loss of disposal site capacity, loss of local jobs, and loss of continued contributions to the P C and M fund. (35)

RESPONSE: Thank you for your comment.

296. COMMENT: Energy Northwest uses the site for the disposal of LLRW. Energy Northwest employs between 100 and 1100 employees. (35)

RESPONSE: Thank you for your comment.

297. COMMENT: SPC uses the site for disposal. SPC/Richland employs 800 to 900 persons. (35)

RESPONSE: Thank you for your comment.

298. COMMENT: Several large employers depend on the facility to meet their environmental requirements, including Energy Northwest (1000 employees), Seimens Power (800 employees), and Allied Technology Group (200 employees). (14)

RESPONSE: Thank you for your comment.

299. COMMENT: The site contributes to employment diversification in the local area. (78)

RESPONSE: Thank you for your comment.

300. COMMENT: It is important for the EIS to recognize the importance of the commercial LLRW disposal site to the Tri-Cities economy. Contributions to the HAEIF have contributed to creating over 600 jobs for the regions. Several months ago, LaMarr Motor Coach decided to relocate its manufacturing operations to Pasco, partly because of HAEIF funding. It is expected to create 200 jobs over the next five years. (14)

RESPONSE: Thank you for your comment.

301. COMMENT: The LLRW disposal site is an exceedingly important component of the economic infrastructure of the area. Waste surcharges provide a large amount of funding to Benton County and the HAEDF, which stimulates and diversifies the local economy. (12)

RESPONSE: Thank you for your comment.

302. COMMENT: If the license is denied, the local area will suffer impacts from loss of local revenue, loss of jobs, loss of disposal capacity, and loss of continued contributions to the PC&M Fund. (12)

RESPONSE: Thank you for your comment.

10.2 Cumulative Effects

303. COMMENT: The Department of Energy's projected cumulative dose for the entire central plateau is six mrem of which "the contribution from the commercial LLRW facility would be minimal" (DEIS pg**.** 129). This is at odds with predictions for the Commercial LLRW site alone given in Table 18a and Table 18b. For full disclosure, we suggest adding the following sentence at the end of the first full paragraph on page 129: "The conservative modeling and pathway assumptions employed in this EIS resulted in significantly higher predicted hypothetical doses than those predicted by DOE. This is further explained in Chapter 10 of Appendix II." (15)

RESPONSE: The 1998 Composite Analysis predicted a total cumulative dose from Hanford's central plateau of six millirem per year. The commercial LLRW site was predicted to contribute a minor amount to the six-millirem dose. The six-millirem dose is not directly comparable to the doses predicted in the EIS because the two analyses used different theoretical models, different lifestyle parameters, and different points of compliance. However, USDOE's conclusion that the commercial LLRW site will contribute a minor amount to the future cumulative dose remains relevant. This point has been clarified in Section 6.7, Cumulative Effects, in the Final EIS.

304. COMMENT: Page 128. This section does not consider potential significant contributions to cumulative effects, including USDOE cleanup actions, Siemens, ATG, and Energy Northwest. (10)

RESPONSE: SEPA requires an EIS to include reasonable references to past projects and future expectations. The EIS references several USDOE documents that address cumulative effects, and includes statements as to the relative contribution of the commercial LLRW site. The number and diversity of facilities on or adjacent to the Hanford Site make a more precise evaluation of

cumulative effects beyond the scope of this EIS. Please see Section 6.7, Cumulative Effects, in the Final EIS.

305. COMMENT: There is no cumulative risk analysis in the real meaning of the word. SEPA requires you to sum the risk of the hazardous constituents and the radionuclides. MTCA requires this also. The EIS must include this. (29)

RESPONSE: The risk of non-radioactive hazardous constituents is not included in the Final EIS. Risk from hazardous waste will be determined following the 2004 MTCA investigation.

306. COMMENT: Tables 2, 3, 4 and 5. Although SEPA requires consideration of direct, indirect and cumulative impacts, there appears to be no requirement to address cumulative impacts according to the CEQ NEPA prescription, namely in association with past and reasonably foreseeable future actions. However, the summary does not really summarize the material in Section 4.2.9, but appears to only rollup the preceding impacts of the summary. (10)

RESPONSE: Please see the response to Comment #304.

307. COMMENT: Consideration of the license renewal must include cumulative impacts from renewal; e.g.: the EIS presents the impact of license renewal (improperly ignoring the impact of increasing NARM volumes to 100,000 cubic feet) as adding 2 millirem of additional annual dose to a Native American child. However, the analysis fails to consider the cumulative impact from all license renewals through 2056, that under the same scenario would result in the exposed Native American children having increased cancer risks that are 44 times the allowable maximum cancer risk under MTCA. (29)

RESPONSE: The 2 mrem dose in the Draft EIS represented the increased dose to the Native American child for <u>all</u> potential license renewals through 2056. In the Final EIS, if the site continues to be relicensed over the next 50 years and is closed with the preferred cover design and schedule, there is little or no increased dose predicted from the additional 50 years of operation for *any* of the hypothetical lifestyles. Please see Section 4.4, Post-Closure Radiological Dose, in the Final EIS.

308. COMMENT: The cumulative risk of additional waste to this site, in combination with other risks, is not addressed. I am requesting that you include all of the other contamination factors through the entire site, and come up with a more realistic model of how many illnesses and people will be affected. (79) (8)

RESPONSE: Risks from waste disposal, transportation, cover construction, and operations were included in the EIS. It is not feasible to add these risks together because they affect different populations at different times. For example, the cover construction risks affect site workers, the transportation risks affect

persons living or traveling on one of the transportation corridors, and the post-closure risks from waste disposal affect a person living and/or trespassing on or adjacent to the commercial LLRW site. Risks to site workers and to persons in transportation corridors occur during operations, and the post-closure risks occur following the completion of operations. Please also see the response to Comment #72.

309. COMMENT: The DEIS fails to address cumulative risks for cancer arising from all conditions at the site. (19)

RESPONSE: Please see the response to Comment #308.

310. COMMENT: Until this site (Hanford) is under control, we'll never know the full impacts of synergistic and cumulative impacts. We urge you not to accept any new additional wastes to this disposal site. (18)

RESPONSE: Thank you for your comment.

311. COMMENT: I demand the EIS address cumulative impacts from adding large quantities of long-lived radioactive NARM wastes to Hanford's soil, and contaminated groundwater plumes. (43)

RESPONSE: The impacts of NARM on groundwater are minor because the primary radionuclide (radium) in NARM does not leach to groundwater but instead emanates as a radon gas. Please see Section 4.4 of the Final EIS, Post-Closure Radiological Dose, for a discussion of impacts from radon.

312. COMMENT: The cumulative risks from NARM transportation are not addressed. There is a significant transportation impact and the EIS ignores it. What is the risk of adding 100,000 cubic feet of transported waste per year, some years perhaps 400,000 cubic feet, other years less? What are those risks by transportation routes when we're talking about I-90 through downtown Spokane and I-84 over the Blue Mountain Pass? (29)

RESPONSE: Transportation risk for all of the diffuse NARM alternatives was predicted to be low. The Diffuse NARM Preferred Alternative does not include an automatic rollover provision. Please see Section 4.2, Transportation Risk, in the Final EIS.

313. COMMENT: I demand the EIS address the cumulative impacts of allowing more radioactive waste shipments along I-84 and I-90. (43)

RESPONSE: Transportation risk was predicted to be low for both LLRW and diffuse NARM. Please see Section 4.2, Transportation Risk, in the Final EIS.

10.3 Environmental Justice

314. COMMENT: Page 131 – One method to illustrate possible EJ is to show the relationship between doses for Native Americans and others in the intrusion scenarios. In this case, because of the radon artifact, there would appear to be no EJ issue for the commercial LLRW site. (10)

RESPONSE: Environmental justice impacts were re-evaluated for the Final EIS using the revised Radiological Risk Assessment (Appendix II). Please see Section 6.6, Environmental Justice, in the Final EIS.

315. COMMENT: Page 131 – There is no mention of the African American population in the area. Although it is very small, there could be a sentence or two stating the percentage and why they will not be affected by the proposed action. (10)

RESPONSE: Based on the 2000 census, the ethnic composition of the minority population is comprised of six different populations, including Hispanic, Native American, Asians and Pacific Islanders, African Americans, “other” races, and persons of two or more races. This information has been included in the Final EIS. For the analysis in the Final EIS, the Native American population was used as an indicator of environmental justice impacts because of their sensitive lifestyle and proximity to the site.

316. COMMENT: Environmental justice impacts should relate to material addressed in Section 4.3.1, which discusses existing and reasonably foreseeable area demographics. We suggest replacing all responses in this section with: "There are no reasonably foreseeable incremental adverse impacts on Native Americans or other minority or low-income populations." (15)

RESPONSE: The Radiological Risk Assessment (Appendix II) predicts hypothetical impacts to both the Native American and the Rural Resident community. However, a disparate impact between the two communities was not found. The Final EIS recognizes that USDOE has designated the central plateau Industrial-Exclusive and intends to use institutional controls to control access to the central plateau for the foreseeable future (USDOE 1999). State regulations also require that institutional controls be used to restrict access to the commercial site for at least 100 years. Although neither USDOE’s land use plans nor the state’s regulations specifically address the use of institutional controls in perpetuity, it will be every generation’s responsibility to ensure that access is restricted to the central plateau for as long as necessary to protect public health. Please see Section 4.4.3, Institutional Controls.

10.4 Costs and Surety

317. COMMENT: The EIS needs a complete and accurate financial analysis that includes the finances available for site closure, remediation and maintenance,

estimated costs of an adequate site characterization and RCRA compliant closure plan, revenues available, or revenues that would be made available if Ecology exercised its authority to charge a closure fund fee. (22)

RESPONSE: Surety analyses were done both for closure and for perpetual care and maintenance. Please see Section 6.8, Surety and Closure Costs, in the Final EIS.

318. COMMENT: We need a commitment from US Ecology and the State that the cost of cover designs and their implementation will be fully funded, and this requirement is figured into generator fees. (10)

RESPONSE: State law requires an annual surety analysis for closure and maintenance of the site. If that analysis shows that adequate funds are not available, the state must take action to obtain those funds. Please see Section 6.8, Surety and Closure Costs, in the Final EIS.

319. COMMENT: What have the disposal ranges been over time? This is a particularly sensitive issue for USDOE because of closure costs. Current and anticipated closure reserve cost data need to be provided. (10)

RESPONSE: Disposal of LLRW has ranged from a high of approximately 1,500,000 cubic feet in 1985, to approximately 49,000 cubic feet in 2001. NARM volumes have ranged from approximately 75,000 cubic feet in 1995 to 4,500 cubic feet in 2002. This information is included in Section 2.3. Waste, in the Final EIS.

320. COMMENT: Why aren't closure fees charged? Who is benefiting from this policy? When and how it is going to be objectively assessed? What are the ramifications to the taxpayers if fees are not assessed? (22)

RESPONSE: A closure fee has not been charged since 1992 because there appeared to be a reasonable likelihood that sufficient funds were available to complete closure activities. The state evaluated the adequacy of the funds for the cover design and schedule alternatives and determined that sufficient funds are available for the preferred alternatives: the GeoSynthetic Cover Design; and the Close-As-You-Go Schedule. If the state determined that additional funds were required, a new closure fee for generators would be one of the methods considered. However, current waste volumes disposed at the site are so low, it is unlikely that much additional revenue would be generated through a closure fee. Fees for perpetual care and maintenance are currently being charged.

321. COMMENT: Pg 135. This section does not discuss the potential costs for remediation of hazardous wastes, which brings the adequacy of the closure fund into question. Sufficient funds must be provided by the State in the closure fund to cover any reasonable cleanup without diverting DOE cleanup funds. (10)

RESPONSE: The state will not know the exact costs of additional remediation of hazardous wastes until the 2004 MTCA investigation is completed. USDOE cleanup funds will be not be used if additional remedial actions are needed.

322. COMMENT: Pg 66. Projected cost of closing the chemical trench should be separately discussed. (10)

RESPONSE: The cost of closing the Chemical Trench, by itself, is not an alternative in the EIS.

11.0 APPENDIX II

323. COMMENT: App. II – This appendix addresses offsite scenarios that, while off the US Ecology Site, are in fact on the federal government-controlled Hanford Site and not the usual "offsite" environment of urban and rural residences, etc. (10)

RESPONSE: The regulatory requirements for this commercial LLRW site stem from 10 CFR 61 and Chapter 246-250 WAC. The requirements obligate DOH to perform the analysis at the closest offsite location, and do not provide the opportunity to consider other facilities in the area.

324. COMMENT: App. II – This section is internally inconsistent. The section title refers to an offsite critical population, but the cited line states that the individual is assumed to live a lifetime on the site. (10)

RESPONSE: The second sentence in the second paragraph of Section 3.2 should have read: "The individual is assumed to spend 365 days per year at the commercial LLRW site boundary over a 70-year lifetime."

325. COMMENT: App. II – This is an extremely important section that should have been highlighted early in the EIS. Why would one estimate fission product activities (Tc-199, I-129) based on Co-60, principally an activation product, just because it is readily measurable? If the results presented in the EIS are divided by 100 to 10,000, the "impacts" become less than trivial. (10)

RESPONSE: Until recently, perhaps the last ten years or so, I-129 was extremely difficult and expensive to measure, particularly at detection levels currently used. Using a surrogate method for reporting a quantity was an accepted practice, assuming one can show that the relationship between the two radionuclides is robust.

326. COMMENT: App. II – On what basis is it assumed that all C-14 is available in a gaseous form? (10)

RESPONSE: The revised groundwater model assumes that a percentage of C-14 will impact groundwater. The basis for the state's assumption in the Draft EIS is the report *Biodegradable Inventory of Carbon 14 and Its Release to the Atmosphere at the Richland Low-Level Waste Site*, prepared by Man-Sung Yim for DOH, dated June 27, 1997. The assumption that the C-14 is available in gaseous form (as compared to a liquid phase) has been shown to be a conservative assumption in the Final EIS.

327. COMMENT: App. II – Provide the basis for the assumption that the Rn-222 and Rn-220 concentrations are the same. (10)

RESPONSE: The 1996 activity for Ra-226 is 208.8 Ci. The 1996 activity for Th-232 is 209.7 Ci. Because the Th-232 progeny are in equilibrium, Rn-220 can be thought of as equivalent to Rn-222, the immediate progeny of Ra-226.

328. COMMENT: App. II – While the uncertainty analysis appears to be well done for the parameters considered, the cited sentence and the last sentence of that paragraph on page 90, "…the potential uncertainty in Tc-99 and I-129 source term is not considered…" seriously detract from analysis and will surely confuse the reader. (10)

RESPONSE: The predicted dose contribution from the uranium series later in the analysis timeframe is similar in dose to the predicted contributions from the Tc-99/Cl-36 that occurs earlier in the analysis timeframe. As mentioned in Chapter 10 of Appendix II, the difference in the predicted results would be at most 30%, even if the inventory for Tc-99 and I-129 were removed entirely. Probability estimates for I-129 and Tc-99 were not included because insufficient information exists to even quantify the error in the two inventories.

329. COMMENT: On page 102 of Appendix II, the risk analysis states that all of the results are greater than the acceptable free-release criteria and would indicate the need for some type of institution controls to limit the dose received by individuals. (22)

RESPONSE: The modified MTCA analysis completed for the Draft EIS has been deleted from the Final EIS because MTCA is not being applied to radionuclides at the commercial LLRW site. However, if MTCA were applied to the commercial LLRW site similarly to how it is applied elsewhere at Hanford, it is likely that the commercial LLRW site would be classified as less than a 1/100,000 risk. This classification is likely because the groundwater would not be considered, the contamination in the vadose zone is greater than 15 feet in depth below the surface, and there is no airborne contamination in significant quantities. Without these pathways, it would be difficult under MTCA to identify any elevated risk from a radiological standpoint.

12.0 REFERENCES

330. COMMENT: The references and public record for the Draft EIS are incomplete. Add all agency technical comments and associated site documents (i.e. the 1985 site assessment) to the public record. (22)

RESPONSE: A list of key supporting documents has been added to the introductory pages of the Final EIS.

13.0 STATEMENTS OF SUPPORT AND/OR NON-SUPPORT OF THE PROPOSED ACTIONS

13.1 License Renewal

Statements In Support of Renewing the US Ecology License

331. COMMENT: I support license renewal. (39) (27) (30) (4) (34) (31) (78) (23) (56) (3) (35) (12)

332. COMMENT: We believe DOH and Ecology have been doing a very good job of regulating the facility and we support the continued operation of the facility. (21)

333. COMMENT: The commercial LLRW disposal site supports the national objectives for the compact system, especially for medical wastes. (21)

334. COMMENT: The facility has excellent geological and hydrological characteristics and it is ideally suited for the disposal of radioactive material. (21)

335. COMMENT: We believe US Ecology is operating the site in a responsible manner and support the facility be relicensed. (21)

336. COMMENT: There is a present need for the commercial LLRW disposal site for the disposal of medical isotopes. (75)

337. COMMENT: I support the three actions in the EIS. (45)

338. COMMENT: The commercial LLRW disposal site license should be renewed. The facility has operated safely since 1965 and serves an important function for this region. It provides a safe, reliable waste disposal option. It is centrally located for waste generators. A safe regulated facility with reasonable disposal costs is of great benefit to the region. (16) (13)

339. COMMENT: The site is in an arid environment, remotely located and imposes no risk to the general public. (16) (13)

340. COMMENT: I am a three-time cancer survivor and I support relicensing the waste disposal facility because it is important to have a disposal site for the production of medical isotopes for treating cancer. (68)

341. COMMENT: I have three concerns. They are clean up Hanford, and protect our beautiful river, and provide a safe disposal site for hospital waste. You have to have a contained monitored place for medical waste from hospitals and universities. (68)

342. COMMENT: I am in firm support of renewal of the license. The commercial LLRW disposal site has contributed a $6.50 surcharge to our community that has diversified our economy and has helped a lot of people. (24)

343. COMMENT: Benton County strongly encourages the state to approve the five-year license extension for US Ecology. Benton County believes the current location of the commercial LLRW disposal site is the best alternative from an environmental and public health standpoint. It is central located to the majority of waste generators. Being centrally located decreases transportation hazards. The current location is also good because it is subject to USDOE long term stewardship, is in an arid environment, and is in a supportive and well educated community. Sending our waste to Idaho or Utah seems ludicrous. (2)

344. COMMENT: I have reviewed the EIS and personally inspected the commercial LLRW disposal site and it is clear to me there is no indication that any continued operation of this site will increase any dangers to the public, to the environment, or to the employees of US Ecology. (33)

345. COMMENT: I am in firm support of renewal of the license. The commercial LLRW disposal site has contributed a $6.50 surcharge to our community that has diversified our economy and has helped a lot of people. (24)

346. COMMENT: This operation has produced no health or safety risk and future risks are minimal because public exposure is not a factor due to the site's location. (27)

347. COMMENT: With respect to license renewal, US Ecology has operated the facility in a safe manner for many years. There have been no license violations for over 10 years. (58)

348. COMMENT: Proceed promptly with renewal of the US Ecology license without any additional enhancements. (71)

349. COMMENT: I support relicensing. If you go into areas where there are not agreement states, waste from radionuclides piles up. I've seen this in Texas, California and New York. (25)

350. COMMENT: I am positively for the relicensing of the commercial LLRW disposal site. I believe this site provides important infrastructure for the FFTF restart. (47)

351. COMMENT: The unions represented by this council are in favor or relicensing this site. It is essential to have some place to put things that you don't want to have scattered all over. This site has proved to be a good one in the past and I believe it will be a good one in the future, and if properly managed, it should provide a safe place for us to dispose of hazardous wastes. (32)

352. COMMENT: We strongly support the relicensing of this site for another 5 years. It has operated for over 30 years without significant problems, environmental impact, or hazard to the public. Its contribution to regional public radiation dose rates is insignificant compared to natural background radiation and the radiation releases from the USDOE Hanford site. We strongly support the extension of the lease agreement and continued operation of the site by US Ecology. (16)

353. COMMENT: Our longstanding business relationship with US Ecology and the disposal site has allowed us to observe first hand the diligent efforts of US Ecology to ensure complete and proper adherence to regulations and good practice. We believe the commercial LLRW disposal site is an important component to the Tri-Cities economic infrastructure. The site adds to the employment diversity in this area and surcharges help bring new industry into the area. We urge the state to quickly complete the EIS and renew the facility license. (28)

354. COMMENT: The commercial LLRW disposal site is an important and fundamental part of modern medicine for our citizens. The EIS process should be completed and the license granted to continue operation of the site. (65)

355. COMMENT: Consideration of the cancer in other patients, whose health and life depend on medical isotopes, should definitely be given in license renewal. Without adequate LLRW sites, treatments using medical isotopes will not be available. Living in the vicinity of a low-level site, our home is being in Richland, is not a personal safety concern. Based on a comparison of the risk versus the benefits, the operating license for this site should be issued. (64)

356. COMMENT: We urge the state to complete the EIS and renew the license. Medical isotopes are used 40,000 times a day in the U.S. for diagnosing disease. For the public to benefit, the infrastructure for handling the waste must be present. The commercial LLRW disposal site is a crucial component of this infrastructure. It receives waste from hospitals and research institutions and will also play a role in FFTF if it is recommissioned. (11)

357. COMMENT: It is imperative to keep the site open for a number of reasons, but certainly for the diagnosis and treatment of human disease that will generate radioactive medical or research waste. (1)

358. COMMENT: I support relicensing. A safe reliable and economical low-level radioactive waste disposal facility is absolutely necessary to support promising medical research to develop new and improved treatments for cancer. These activities generate small amounts of LLRW that must be safely disposed. Where access to LLRW disposal facilities is not available, medical research has been slowed or halted altogether. (17)

359. COMMENT: The 35-year safety record of the facility is excellent and the EIS supports that the site can be safely operated for at least another 50 years. (17)

360. COMMENT: The use of the 100-acre site is totally consistent with surrounding land uses and will have insignificant environmental impacts. (17)

361. COMMENT: Please expeditiously conclude the EIS process so we can have assurance that this facility will continue to be available. (17)

362. COMMENT: Medical isotopes are used 40,000 times a day in the U.S. for diagnosing disease. For the public to benefit from medical application of radioactive isotopes, infrastructure for handling the waste must be present. The commercial LLRW disposal site is a crucial component of that infrastructure. We urge you to complete the EIS and relicense the site. (6)

363. COMMENT: Use of 100 acres is totally consistent with USDOE present and future land use. (31)

364. COMMENT: The EIS confirms the facility can be operated for at least 50 more years and then closed in accordance with criteria that the state deems appropriate. (31)

365. COMMENT: A safe, reliable economical low-level waste site is a necessary part of the medical research infrastructure. This site has, should continue to be, part of that infrastructure. (3)

366. COMMENT: The site is consistent with surrounding present and future USDOE land use. (3)

367. COMMENT: Environmental impacts, if any, from this site are insignificant when compared to the larger USDOE operation. (3)

368. COMMENT: Siemens Power Corp disposed of low-enriched uranium wastes at the commercial LLRW disposal site. The ability to dispose of our waste in a safe and cost-effective manner is a business necessity for SPC. (23)

369. COMMENT: The site is consistent with surrounding land uses. (23)

370. COMMENT: The extensive Hanford environmental surveillance program provides a unique opportunity to effectively detect and evaluate potential site impacts. (23)

371. COMMENT: The site constitutes a valuable asset to key industrial and medical activities within the region. (23)

372. COMMENT: This site provides a necessary and beneficial pubic service. (35)

373. COMMENT: This site does not constitute a public health nor have any significant impacts. (35)

374. COMMENT: This site is the only disposal site generally available for users of radioactive materials in eleven western states. (35)

375. COMMENT: The site is consistent with USDOE present and future land use. (35)

376. COMMENT: Environmental impacts, if any from the commercial LLRW disposal site are insignificant when compared to Hanford. (35)

377. COMMENT: US Ecology management and our members have formed a topnotch team to make the site a safe, regulatory compliant workplace. I am impressed with the level of training and emphasis on safety. (78)

378. COMMENT: Someone has to handle and dispose of these wastes. The medical community relies heavily on radioactive materials. The commercial LLRW disposal site has been and should continue to be the facility that deals with these wastes. To do less would either shut off these medical benefits or create unlicensed mini-disposal sites throughout our region. (78)

379. COMMENT: Provides safe, reliable and economical waste disposal site for medical research. (12)

380. COMMENT: License renewal is consistent with surrounding land use. (12)

381. COMMENT: Impacts are insignificant when compared to the larger USDOE operations at Hanford. (12)

382. COMMENT: The evaluations in the DEIS clearly indicate that the continued operation of the facility under any of the NARM and closure cover alternatives will not have significant short-term and long-term impacts. (7)

383. COMMENT: A review of the DEIS impact summary for license renewal (Table 2) reveals that the impacts are minor and not measurably different for any of the renewal scenarios. Exceptions are the substantial socioeconomic impacts

associated with license denial. We believe that the DEIS provides ample basis for DOH to move forward on the pending action of license renewal. In fact, the assessment more than validates the determinations of nonsignificance (DNSs) that were the basis for previous renewals. (7)

384. COMMENT: The continued presence of the burial site ensures environmentally safe disposal of waste generated in the Northwest Compact. (9)

Statements in Support of Denying the License

385. COMMENT: I am opposed to relicensing this site. The site should be shut down and no more wastes should be brought into Washington. (73)

386. COMMENT: I ask, plead, beg and threaten the state of Washington to not relicense the site. If you do relicense, then I ask you ban the proposed additional import and disposal of 100,000 cubic feet per year of NARM. (76)

387. COMMENT: How can the DOH even think about allowing more radioactive waste to be produced and dumped in Washington? This sure sounds like a sneaky deal between you and US Ecology. (53)

388. COMMENT: Why are we adding more wastes to a site when the DOH risk assessment establishes that if you select the least protective cover alternative, 3 percent of Native American children and families exercising their treaty rights would die of fatal cancers from this site alone even without any intrusion into the site? (29)

389. COMMENT: The current priority at Hanford must be resumption of the inexcusably tardy cleanup plan to stop current leakage and contamination of groundwater and the Columbia River. (69)

390. COMMENT: Concerned that the amount of waste imported under the EIS proposal would add to the already many cancer cases in this state affected by Hanford. (60)

391. COMMENT: Why do we want to continue ruining our land when it is proven that radioactive wastes disperse hundreds of years later? (66)

392. COMMENT: Do we want to kill our youth by prolonging the closure of the site? Are you slowly trying to kill the population and animals that habitat the land and water? If you are, it's working. Think twice about what you are doing with our lives and yours – don't let short sightedness and greed, money or power decide your decision. (66)

393. COMMENT: Washington has had more than its share of hazardous waste. We don't want and we don't need to import such massive additional quantities of waste. (77)

394. COMMENT: I oppose using this facility in the future for any purpose until everything is cleaned up first. (55)

395. COMMENT: I do not think we should create or accept any more waste. We should close the site and not renew the license. We can see how close we came to disaster, like this summer at Los Alamos. A report, ordered by USDOE and prepared by the National Research Council, said that Hanford would never be clean. The report also said that all the technology that we have today would eventually fail. We can't keep creating and accepting waste and pretending that this isn't going to kill every living thing on this earth. (44)

396. COMMENT: Concerned about the plan to import nuclear waste to a commercial dump site at Hanford. It seems there is once again a push to increase the amount of nuclear waste at Hanford while failing to keep promises regarding cleanup and safe management of waste already there. (37)

397. COMMENT: What are we doing even considering accepting additional or new waste to this site that we all know is the most contaminated land mass in the western hemisphere? There is a long history of this site being grossly mismanaged. (18)

398. COMMENT: There is no safe level of radioactivity in the environment. We expect the state to stand firm against any further import of waste to Hanford at least until the high-level tank waste and solid waste sites are reedited. We staunchly oppose license renewal until significant progress on the Hanford cleanup is achieved. (38)

399. COMMENT: Stop using Hanford as a disposal site for toxic hazardous wastes (i.e., plutonium processing by-products). (57)

400. COMMENT: I favor site closure. You folks are already spending millions of tax dollars cleaning up the mess you made at Hanford. The Salmon and Columbia River are poisoned by 2015. Why create more of a mess. (46)

401. COMMENT: The site should not be relicensed. You should ban the importation of any more high or LLRW because it has already been proven that the people managing the site can't handle what is already there, evidenced by leaching of existing waste into groundwater. (79)

402. COMMENT: We have a fundamental problem with the whole process. This dump site is out of compliance and it has contaminated groundwater. We support Alternative one – shut the site down. For new waste, a new site should

be built that is state of the art. In the year 2001, there is no reason to be dumping waste into unlined trenches. (8)

403. COMMENT: The license should not be renewed under current circumstances. Currently, this facility is not complying with RCRA, has not shown a good faith effort to comply with the law as evidenced by past site violations and their current appeal, and is operating without being subject to MTCA. (22)

404. COMMENT: From a technical standpoint, the EIS does not demonstrate that continued operation of the facility can continue without serious environmental impacts. A goal of the EIS should be to clearly identify the potential problems and the associated real or potential environmental impacts along with the uncertainties associated with the current knowledge or lack of knowledge of the system. Once this is done, then an appropriate value judgment can be made as to the potential risks of operating the facility relative to the real need for a low-level waste disposal facility and relative to other alternatives. In this reviewer's judgment, the EIS is biased on the side of presenting only data that will help justify the continued operation of the facility while minimizing or ignoring any data that could pose a problem for re-licensing. As a result, the value judgment is not properly represented and the EIS is not valid as a decision making document. (5)

405. COMMENT: The total amount of waste disposed at the commercial LLRW disposal site should be reduced because of cancer risks that exceed our state's standards. (74)

406. COMMENT: I strongly believe that we have to have a low level waste disposal facility but not this one. Not an unlined disposal facility when we've got adequate geologic and contamination evidence that an unlined facility is not adequate in this area. In comparison, ERDF is a quarter mile away. ERDF is a lined facility that was designed to handle low level waste in a proper manner. (5)

407. COMMENT: The hazardous wastes that are currently leaking have not been fixed. There are also other problems that have not been included in the EIS. The facility is inadequate and should be not relicensed and permanently closed. It should be replaced with a high-tech, state of the art, safer facility. (79)

408. COMMENT: I suggest that you do not relicense this site and look into building a new plant that's high tech and will contain these things until alternative cures (other than medical isotopes) can be found. (41)

13.2 Diffuse NARM

Comments in Support of 100,000 cubic foot per year Diffuse NARM (Alternative 1)

409. COMMENT: I support the 100,000 cubic feet per year limit on diffuse NARM. (16) (27) (17) (34) (3) (35)

410. COMMENT: Support the 100,000 cubic feet per year of NARM with the rollover option. (71) (56)

411. COMMENT: Keep the level of waste at a minimum of 100,00 cubic feet per year (of NARM). (25) (28) (39)

412. COMMENT: I support the three actions in the EIS. (45)

413. COMMENT: The WAC should be amended to establish a 100,000 cubic foot per year limit for diffuse NARM. (16) (13)

414. COMMENT: It is important that no further limitations be put on the amount of NARM. Disposal profits from NARM disposal are shared with the non-NARM customers. This provides industry, hospitals and universities with the ability to maintain access to such a facility at a low cost. This is very important**.** (58)

415. COMMENT: Support 100,000 cubic feet of NARM based on past history of safe acceptance. (78)

Comments Against Diffuse NARM Alternative 1 and/or in Support of Alternatives 2-4

416. COMMENT: I believe that adding more waste to Hanford (100,000 cubic feet per year NARM) is intensely foolish. If you go through with this you will only make a mockery of your department and increase the cynical skepticism we as American citizens have for our institutions. (61)

417. COMMENT: I oppose importing another 100,000 cubic feet of NARM waste at Hanford. (55)

418. COMMENT: I am appalled that a deal between DOH and US Ecology could double the amount of radioactive wastes transported into Washington State. Allowing 100,000 cubic feet of NARM will double the amount of waste disposed at the site and lead to 400 to 1000 more truckloads of radioactive waste each year. Everyone is impacted humans, animals, habitats, lakes and rivers. Most certainly the health and safety of everyone will plummet. (72)

419. COMMENT: Get Hanford cleaned up and stop leaking of radioactive materials into the groundwater and the Columbia before you consider importing an additional 100,000 cubic feet of NARM. (77)

420. COMMENT: The EIS does not even consider the option of reducing the amount of such waste or of continuing to import the same amount of waste as is currently imported. (77)

421. COMMENT: Ban the proposed additional import of NARM. (49)

422. COMMENT: Please reconsider the shipment of additional radioactive waste to Hanford. I live on the Columbia River and the safety of the river is very important to me. My husband is a windsurfer and already has sinus problems every time he is in the river. Please keep this area clean. It affects so many people! (54)

423. COMMENT: Ban the additional import of 100,000 cubic feet per year of NARM. These wastes are far more long-lived radionuclides and emit radioactive gas in greater amounts than other wastes currently disposed in the dumpsite. (43)

424. COMMENT: I advocate the NARM alternative be 8600 cubic feet per year, or less, with no rollover alternative. (36)

425. COMMENT: The state needs to flat out bar the additional import of 100,000 cubic feet per year of NARM because NARM increases dose and cancer risk from the site. (29)

426. COMMENT: No NARM waste should be taken. (74)

427. COMMENT: I do not support any NARM waste coming to this site. (79)

428. COMMENT: I am against the importation of any NARM waste to this site. (73)

429. COMMENT: I would like to see an alternative of 0 NARM waste. (36)

430. COMMENT: Examine the benefits of not allowing any NARM waste or an amount equal only to the amount generated in Washington annually (with no rollover). (43)

13.3 Closure

Comments Supporting the US Ecology Cover Design & Schedule (Cover Design Alternative 1 and Cover Construction Schedule Alternative 1)

431. COMMENT: We support the adoption of the US Ecology Proposed Cover design and US Ecology Proposed Schedule for closure. (16) (71) (13) (27) (17) (4) (34) (56) (3) (35)

432. COMMENT: The USE Closure Plan should be adopted. (30)

433. COMMENT: I support the three actions in the EIS. (45)

434. COMMENT: I support approval of the US Ecology Proposed Cover Design and Closure Schedule. I would also be supportive of the use of asphalt and large amounts of silt loam that is the best cover that could be put on because if we look at the investment in terms of thousands of years, it will be very small. (39)

Comments Supporting Early Closure of Older Filled Trenches

435. COMMENT: We support closing the inactive trenches, selecting a closure option and get the process going. (21)

436. COMMENT: I support covering the trenches as they are filled and the lining of future trenches. These actions must be included in any license granted. (45)

437. COMMENT: I recommend that the state proceed with closure of the early trenches, and that this work begin as soon as possible. (58)

438. COMMENT: We urge the state to approve a closure plan that includes early closure of older trenches. Doing so would improve environmental protection and provide a greater opportunity to evaluate cover performance while the site is still operating. (28)

439. COMMENT: Given the immense health burden on our state at Hanford already, we urge your departments to schedule the earliest possible closure of this site. (38)

440. COMMENT: Approve a closure plan that will allow the opportunity to properly close some of the older trenches at the site. (78)

441. COMMENT: Interim capping should occur to mitigate impacts, with full understanding that RCRA and MOTCA requirements may well require retrieval of wastes, installation of liners and use of additional or entirely different forms of caps. (29)

442. COMMENT: Require the burial trenches to be capped with long-term protective covers. (43)

REFERENCES

DOH, 1997, *Hanford Guidance For Radiological Cleanup, Rev. 1*, WDOH/320-015, Environmental Radiation Program, DOH, Olympia, WA.

EPA, 1989, *Risk Assessment Guidance for Superfund, Vol. I, Human Health Evaluation Manual (Part A)*, EPA/540/1-89/002, Office of Emergency and Remedial Response, EPA, Washington, D.C.

EPA, 1996, *Radiation Exposure and Risks Assessment Manual (RERAM): Risk Assessment Using Radionuclide Slope Factors*, EPA 402-R-96-016, Office of Radiation and Indoor Air, EPA, Washington, D.C.

EPA, 1997, *Establishment of Cleanup Levels for CERCLA Sites With Radioactive Contamination*, OSWER No. 9200.4-18, EPA, Washington, D.C.

EPA, 1999, *Radiation Risk Assessment at CERCLA Sites: Q & A*, Directive 9200.4-31P, EPA 540/R/99/006.

GAO, 2000, *Radiation Standards: Scientific Basis Inconclusive and EPA and NRC Disagreement Continues*, GAO/RCED-00-152, U.S. General Accounting Office, Report to the Honorable Pete Domenici, U.S. Senate, Washington, D.C.

ICRP, 1990, *1990 Recommendations of the International Commission on Radiological Protection*, ICRP Pub. 60, ICRP, Pergamon Press, NY.

Kirner, Nancy, 1999, *Final Chemical Risk Assessment For the Commercial Low-Level Radioactive Waste Disposal Facility*, Kirner Consulting, Inc., Richland, WA.

NAS, 1999, *Evaluation of Guidelines for Exposures to Technologically Enhanced Naturally Occurring Radioactive Materials*, National Research Council, National Academy Press, Washington, D.C.

NCRP, 1987, *Recommendations on Limits for Exposure to Ionizing Radiation*, National Council on Radiation Protection and Measurements (NCRP) Rep. No. 91, NCRP, Bethesda, MD.

NRC, 1997, *10 CFR Part 20, Radiological Criteria For License Termination, Final Rule*, Federal Register 62(139): 39058-39092.

PNNL, 1998, *Screening Assessment and Requirements For a Comprehensive Assessment: Columbia River Comprehensive Impact Assessment (CRCIA)*, DOE/RL-96-16, Rev. 1, UC-630, Prepared by Pacific Northwest National Laboratory and the CRCIA Management Team for the U.S. Department of Energy, Richland, WA.

US Ecology, 1999, *Comprehensive Facility Investigation, Richland LLRW Disposal Facility, Richland, Washington, Phase 1 and 2 Report*, technical support provided by Landau Associates, Inc., and others.