

2011 Hanford Lifecycle Scope, Schedule and Cost Report

Summary of Feedback

December 2011

1. Martin Bensky, Richland, Washington

The article on Hanford cleanup costs in the Tri-City Herald on November 6, 2011 indicates clearly that there is little or no concern for assessing the actual potential health risks to people who might be exposed to any of the waste via credible exposure scenarios. The idea that waste must be removed simply because "it's there" is patently foolish and an insult to the American taxpayers who want the money allocated to public agencies to be used for genuinely useful purposes.

Neither the Hanford Advisory Board nor the Department of Energy (USDOE) seem to have any incentive to complete Hanford cleanup expeditiously or economically. The Board certainly has absolutely no competence to make judgments about risk, and the USDOE seems to have ignored the results of their own risk assessments, e.g., the analysis that casts strong doubt on the need for retrieval and vitrification of tank waste when in situ disposal would have no likelihood of human intrusion or ultimate arrival of harmful amounts of any radionuclides into groundwater due to natural processes.

Oversight groups like the Defense Nuclear Facilities Safety Board (DNFSB) are useful in the sense that they review technical issues to ensure that work is done safely. Their scope should be augmented, or a new board should be formed, to review the overall cleanup plan to ensure that money is not wasted performing activities that do nothing to reduce risk.

2. Don Meyers, Kennewick, Washington

Hi to DOE Richland Operations Office and Shannon Ortiz,
My comments to the Sunday, Nov 6, article in our Tri City Herald regarding the "\$115B not enough" are provided herein. Sorry they **are lengthy, but I feel all is needed** since they go back to the 1990's. That's when a couple Rockwell/Westinghouse Hanford engineers were requested to design systems to empty 99.9% of waste from two of Hanford's High Level Liquid waste tanks. This was a **very stringent requirement** of the Tri Party Agreement.

It had been suggested in about 1992, an **Alternate Approach** to: 1) remove all liquid waste by existing proven Hanford methods; 2) dry remaining solids; 3) fill up tank volume with contaminated equipment and soil; 4) close tank; 5) install top cover to isolate from the environment; 6) and fence-in to protect the public. The uneducated guess then was could probably complete for all tanks for \$5 to10 Billion, and take 5 to10 Years. Total adherence to the Tri Party Agreement prevented that Alternate Approach from being pursued. These

comments have been transmitted several times over the past 10-15 years to distributions of all Hanford Cleanup responsible organizations (ref. March 3, 2003 Email below).

DOE, TC & WM EIS,

I am providing my comments on the Cleanup and Closure of Hanford waste storage facilities, including: 1) underground storage tanks, single shell tanks; 2) the FFTF Reactor & auxiliary facilities; and 3) the ongoing and expanded management efforts to dispose of Hanford's waste and waste from offsite. Efforts to complete Hanford Cleanup should be optimized continually, and with preservation of Hanford's History relative to the Manhattan Project. My comments are in the form of excerpts from past suggestions to **optimize the Waste Cleanup effort**, which were transmitted to representatives of Hanford Contractors, State and Federal DOE, State Politics, and the Hanford Advisory Board (all stakeholders).

My 23 years experience at Hanford never directly involved production facilities, only FFTF (18 years fuel exam and handling), BWIP till stopped, Tank Waste Retrieval, and Solid Waste Nuclear Safety.

The optimization of Waste Cleanup would consider alternate approaches to utilize existing facilities and storage areas as in-place disposal sites, thereby generating more **"Cleanup Monuments" and saving much time and cost**. The DOE funding saved can fund the maintenance and operation of the Monuments. The Monuments will show and describe the history of Hanford's plutonium production effort to the very interested public and tourists -- already apparent with Hanford Site and B Reactor Museum tours.

My past comments suggested consideration of Alternate Approaches to achieve the following:

- 1) Use lessons learned about characteristics of waste removed from original storage/disposal locations;
- 2) Leave as much radioactive waste in original locations as safely possible;
- 3) Isolate safe waste monuments from the Public on clean Hanford roads and grounds;
- 4) Let tourists visit the safely fenced monuments to hear verbal descriptions of how each contributed to the plutonium production effort;
- 5) Support B Reactor Museum and other "saved facilities" as Monuments to preserve Hanford's history and possible establishment as a National Nuclear Park;
- 6) Save considerable time of high risk waste cleanup to assure the safety of groundwater, Columbia River, and the public in the Columbia River Corridor; and
- 7) Save millions of DOE dollars that can be used to maintain/operate the Hanford Site and Monuments for tourists to learn of its Manhattan Project History.

These suggested Alternate Approach features and achievements **have been rejected by most recipients**, based on "must exactly meet" TPA requirements.

My more detailed comments on Waste Tank Closure are as follows:

My following comments to Chris Smith on "Changes to Cleanup Decisions on the Columbia River Corridor" are transmitted to you Representatives of the Hanford Cleanup Effort for your consideration and information. I strongly believe there are some very good overall

ideas for Hanford Site restoration in my comments. They are based on my strong interest in this latest “Changes to Cleanup Decisions”, and my past Email transmittals to you that suggested an Alternate Approach be considered. That Approach would expedite cleanup of River Corridor to minimize risk of contamination of the groundwater or the Columbia River.

Chris Smith,

Sorry for the overall lengthy nature of my comments, but I have been very interested in the total Hanford Cleanup for the last 15 years or so!

In response to the DOE/ROO request for Public Comment on “Changes to Cleanup Decisions on the Columbia River Corridor”, my enthusiasm for this approach is apparent from my comments as below. The Tri Party Agencies have taken a big step toward a more realistic cleanup approach (i.e. level of risk vs: extent of effort).

The proposed “significant change to the scope, schedule or cost of cleanup” appears to be a genuine effort to revisit applicable Regulatory Requirements now specified in the Tri Party Agreement. For now, this only applies to the extent of cleaning up the 100-N Area land, and with the added proposal that all future irrigation of that land be prohibited. It follows that any other reactor/processing site cleanup efforts that pose an “extensive effort with no additional protection to the Groundwater or the Columbia River” (or Public or Environment) would also justify revisiting appropriate Regulatory Requirements. Any other extensive cleanup efforts with no additional protection to the Columbia River, Public or Environment would also justify the same consideration.

In the past, I have often proposed that DOE, Hanford Contractors, Wash. State Ecology, Tribes and Stakeholders revisit the Nuclear Regulatory Requirements for Environmental Cleanup as applicable to the Hanford Site. The purpose being to finalize cleanup of Hanford Land, not to “Original Condition”(for unlimited Public use) as stated in the Tri Party Agreement, but to perform the Cleanup to extent there is no realistic hazard to our water, the public and the environment. The remaining “No Risk Contamination” would be disposed of in-place and isolated from the Public as fenced-in sites. All Fenced Cleanup Sites would be included as Monuments in a proposed “Hanford Nuclear National Park”, which would also include the Hanford Reach Monument, B Reactor Museum, CREHST, and FFTF (either operational or cleaned up). The remaining part of Hanford land would be available for Public uses either irrigated or not as determined by Tri Party Agencies. This approach would optimize the Vitrification Plant facility scope and processing effort to only that for readily retrievable, high risk waste. Overall, this would result in very significant savings in Time, Risk and Cost to the United States Government! This savings would be realized many times based on our large number of national cleanup sites.

It seems we will bankrupt our country in trying to cleanup Hanford, then repeat the process at all other national and commercial reactor cleanup sites in the same costly manner! All stakeholders should be most interested in spending otherwise wasted cleanup funds on important national issues regarding our citizens needs. As Cleanup progresses, it is obvious that removing all waste from tanks, basins, burial grounds and structures is no longer feasible. We must review the in-storage waste forms as they now exist, then be sure the Tri Party Agreement and Nuclear Regulatory Requirements still apply for safe storage and removal. Also:

1. How realistic are the risks to the environment, river corridor and the public in its present state?
2. How difficult is removal of all non-pumpable waste from each tank with the existing physical and radiological properties?
3. How feasible to leave waste in-situ in some existing storage/disposal sites?
4. What words of the TPA and/or Regulatory Reqmts need to be re-interpreted or changed to ensure low risk, timely and cost effective cleanup?

My views on overall Hanford Site Preservation cover environmentally safe cleanup, historical preservation and future utilization of land and facilities. That proposed approach is to ensure cost effective efforts on FFTF, Hanford Cleanup and Hanford Museums/National Parks. My general comments above are based on the following information – hopefully to be read and taken into consideration for this current “Changes” effort. This proposed Hanford Nuclear National Park approach applies to the Overall Hanford Cleanup and “Long Term Stewardship Program”

D. MEYERS’ COMMENTS ON LONG TERM STEWARDSHIP PROGRAM

Great title for effort to ensure Hanford’s facilities are demolished, secured and further utilized while preserving the overall Atomic History of Hanford! This being accomplished without endangering our water, the public and the environment, while fully utilizing existing facilities to benefit the Tri City Area, Washington State, and our National Government. My comments on the 3 points of Approach for Long Term Stewardship are addressed as follows:

1. Management of Leftover Contamination

A. Concentrate cleanup effort and funding completely on the River Protection Part of Hanford Cleanup. Do it RIGHT NOW! -- at considerably lower total cost, elapsed time, and risk to the Public and Environment. Could probably complete for only \$5 to 10 BILLION and in 5 to 10 YEARS!! --- Let development of the Vitrification Plant be a parallel effort -- **Vit Plant problems must not delay the River Protection part of Hanford Cleanup!!**

B. Ensure all Radioactive Waste is DRIED UP

1. Forget about total clean out of tank waste -- remove liquid slurry and leave solids.
2. Stir tank liquid/sludge waste into slurry in a safe manner using proven, standard, existing equipment/procedures
3. Pump tank slurry to Evaporator and process, dry out remaining sludge/mud and leave in tank
4. Stir, transfer and process basin liquid/sludge, in proven manner similar to tank waste in (2) above
5. Dryout basin sludge/mud/trash items and leave in basin -- cover to confine contamination
6. Remove liquid waste from cribs/other holding areas in manner similar to tanks/basins.

7. Dispose of Hanford Site contaminated structural and equipment items by placing in dried-out waste tanks, basins and old process buildings (canyons, reactors), while filling voids with contaminated soil, etc.
- C. Remove High Level Radioactive PU/TRU waste (e.g. fissile and irradiated component) from old process buildings and basins, and transfer into surface fuel storage/disposal using safe, reliable and proven transfer/handling methods. For insignificant amounts of High Level PU/TRU, dry out and leave/dispose of in-place within secured/covered facilities.
- D. Keep Low Level Radioactive PU/TRU in existing containers and storage in Hanford facilities until transfer to Permanent Nevada Disposal Facilities.
- E. Leave Low Risk Radioactive/Hazardous waste in storage and disposal structures intact to maximum extent possible, and fill structures with other dry waste like contaminated soil, equipment and materials. Seal/cover the filled structures and facilities for permanent in-place disposal of these waste.
- F. Permanently cover/enclose the filled tanks, basins and buildings so rainwater can't contact contamination and leach to the groundwater or the Columbia River.
2. Protection of the Hanford Site's Cultural, Biological and Natural Resources
- A. Cleanup Monuments
1. Install security fences around permanent cleaned-up waste Areas and building sites to isolate from Public.
 2. Declare each fenced-in site a FEDERAL MONUMENT (like B-Reactor Museum).
 3. Each fenced site would have Tourist actuated audio stations providing description and history of that particular site -- all sites combined would help tell the Hanford Production Story!
 4. The cleaned-up Hanford Site would contain clean public roads and mostly usable lands, with Cleanup Monuments fenced in.
 5. The cleaned-up site Custodian would ensure that in future, if any existing radioactive contamination gets into the groundwater and Columbia River, that it proceeds only at diminishing and acceptable rates.
- B. B Reactor Museum
- This Museum has already proved itself invaluable for tourist understanding about the Hanford Production Reactor's operation. Historical remains are preserved to display various aspects of the reactor's operation and production of the Plutonium. Excellent verbal descriptions are provided on walk-thru tours.
- C. Hanford Reach National Monument
- This unique part of the Hanford Site has preserved the original condition of the Hanford town, Columbia River and surrounding areas. It is apparent there are little adverse affects on the vegetation and wildlife activity on this reservation-type area.
- D. CREHST (Columbia River Exhibition of History, Science & Technology)
- This special museum houses the overall history of the Hanford Atomic activities, with remnants, photos, stories and documented articles to show, display and tell the detailed history of personnel, facilities and way of life at Hanford and communities.

E. FFTF (Fast Flux Test Facility)

The FFTF Project was successful from the first proposals thru design, research & development, construction, plant acceptance testing and initial operation. This facility has been self sustaining as evidenced by its good operating record over the past 20 years of operation. That was possible by performing its own remote maintenance on radioactive equipment utilizing the remote capability of the Interim Examination & Maintenance Cell.

The “fast reactor” (fast neutrons greatly shorten irradiation time) lets materials be irradiated faster to predict long term radiation effects for future materials and energy development. In the same fast reactor environment, FFTF can quickly produce radio-isotopes which are required for medical applications including early detection, treatment and cure of cancer patients. The FFTF has already provided materials research to expedite improvement of reactor plants around the world. The “new generation” of nuclear reactors being considered will require the advanced testing capability of the FFTF.

3. Reuse of the Hanford Site’s Assets

It is apparent that combining the B Reactor Museum, CREHST, and Hanford Reach National Monument efforts, with the upcoming “Hanford Cleanup Monuments” into one overall Hanford Nuclear National Park could result in great savings. Presently our Hanford Site Projects continue to compete for DOE funding and priority which results in increased time, cost and risk.

The total Cleaned-Up Hanford Site would consist of the Cleanup Monuments, with clean roads and lands accessible to the Public. The Cleanup Monuments, B Reactor Museum, CREHST, the Hanford Reach and the FFTF could combine to make up the Hanford Nuclear National Park with all historical aspects preserved. That history would span from initial Hanford construction days to present energy and medical research capability provided by the FFTF Fast Breeder Research Facility. Tourists could visit all these Monuments and Museums to view and hear the overall Hanford Atomic History.

It was bad enough to lose our Hanford Nuclear Power Park when the successful Fast Breeder Reactor Program was terminated in the 1980’s. That started with cancellation of the Clinch River Breeder Reactor Plant, then the planned Full Scale Demonstration plants in New England states and our four Fast Breeder Power Production Plants here at Hanford. We could have furnished electrical power to whole Pacific Northwest – possibly even the West Coast! For just bringing Enriched Uranium into the Nuclear Power Park, recycling the spent fast breeder fuel, and processing the radioactive waste (all within the Power Park site!) and sending clean electrical power out of the Park. A series of about 5 or 6 Nuclear Parks across the U.S. could have provided most of our national electrical energy needs – without depending on foreign supplies!

Let’s not lose this chance for an Economical Hanford Cleanup and National Monument to preserve the atomic age history at Hanford for our Nation.

Nuclear Energy is good – we just need to deal realistically with processing the radioactive waste products. We can take pride in displaying such a successful and high quality facility as the FFTF, and still use it as an important medical, materials, and energy research tool!

Thank you for considering my comments on Cleanup and Closure of Hanford's waste storage facilities . I hope they may help in future discussions to evaluate the decision with long term stewardship and national recognition in mind. The B Reactor Museum may get national Historical National Park status in near future. If so, that can grow to take in the other Monuments to tell the whole story of the Hanford Site history! That could become a real asset to our communities and the whole Columbia Basin Region.

Again, thank you for considering my comments,

3. Ken Niles, Oregon Department of Energy

Thank you for the opportunity to provide comments on the 2011 Hanford Lifecycle Scope, Schedule and Cost Report (DOE/RL-2010-25 Rev. O). The report provides some very useful information and it already has become a valuable reference tool, particularly Appendix D and Appendix E. The document is well written and easily understandable. For the first time in the Hanford cleanup, a single report provides a comprehensive look at the extensive work that remains.

Comprehending the scope of the remaining Hanford cleanup is vital, and this document does fulfill that need. However, it is also vital to understand the likely impacts of accelerating or delaying cleanup projects. In that regard, this document falls short of meeting that need. An estimated project dollar cost does not provide a full understanding of what additional costs may be incurred if a project is delayed, or what costs could be saved if the project is accelerated. As such, we believe the Lifecycle Report does not fulfill Tri-Party Agreement Milestone M-036-01, which states the document should explain "how milestone changes and adjustments will affect lifecycle scope, schedule and cost."

For example, if funding is \$200 million less than is shown necessary for compliance, the assumption may be that it is just \$200 million more that would have to be provided at some later date. There's really no "consequences" or "impact" beyond a delay and possible non-compliance.

That delay, however, presumably has additional costs, such as:

- continued "safe and compliant" costs that would have to be made until a facility/structure is gone
- additional worker training costs, if workers are laid off or moved to other projects and then brought back
- keeping a treatment and/or disposal facility operational longer than planned (or ending up with orphaned waste)
- upgrading/replacing infrastructure that might have otherwise not been necessary

Taking this approach to identifying related costs could also provide information about potential funding saved by accelerating specific cleanup projects.

The limited “safe and compliant” costs that are included for the Plutonium Finishing Plant, the K Area and a few other facilities are revealing and very useful. These costs should be provided – perhaps in a separate appendix – for a larger number of facilities, including individual tank farms. This information would not only help in determining potential costs of delay or acceleration, but would also provide useful information to help prioritize cleanup activities. While broad estimated costs are provided by Area (100 Area, 200 Area, etc.) for the years 2011-2016 (page E-53), a much more detailed breakdown is needed to fully understand what individual facilities/areas are costing to maintain.

The report should also provide cost estimates for realistic scenarios in the event that cleanup activities are further delayed. For example, if tank waste treatment is pushed back, a potential result could be a leaking double-shell tank or a collapsed tank dome. Those potential costs should be estimated and provided in this document.

We understand the need to put an “end date” into this document. However, the document should be very clear that a Long-Term Stewardship mission will be necessary well beyond 30 years after the completion of active cleanup. In justifying decisions to leave waste in place, the U.S. Department of Energy (DOE) has strongly declared that it will have a presence at Hanford – especially in the “Inner Area” of the Central Plateau – for as long as necessary to ensure that waste left behind does not pose a threat to people or the environment. It is not necessary to try and determine how long that will be now, but it is important that this document recognize and state that DOE’s long-term responsibilities will last well beyond 2091.

Again, we appreciate the opportunity to provide comments on this document. We look forward to seeing future versions of the Hanford Lifecycle Scope, Schedule and Cost Report. We have a number of specific comments that follow.

**Additional Comments from the Oregon Department of Energy on the
2011 Hanford Lifecycle Scope, Schedule and Cost Report**

- It would be useful to include the names of the major contractors and their responsibilities. Since this document is to be updated annually, contracting changes can easily be captured.
- The anticipated period of action for cleaning up the Deep Vadose Zone seems unrealistically short. The funding profile shows the work beginning in 2019, increasing in funding in 2020, 2021, and 2022, and then dropping fairly quickly and wrapping up by 2026/2027. Given that most complex projects at Hanford (spent fuel, K- Basin sludge, groundwater, tank waste) have taken far more than this amount of time, it seems that the assumptions for this work should be revisited.

- Figure ES-1 (page ES-3) does not appear to show any “bump” in required funding around 2065 or 2070 to account for the estimated \$676 million cost of reactor removal.
- Text should say the “Oregon Department of Energy,” not the “Oregon Office of Energy.” (page 1-2, section 1.2.2).
- On page 1-11, section 1.5, 5th paragraph, 3rd sentence, the text says that “radioactive and hazardous substances are likely to remain in areas of the Hanford Site, even after cleanup.” We know that substantial amounts of contaminants will remain at Hanford. This should be changed to reflect this fact.
- Table 4-3, “D4 Closure,” states that this work element includes D4 of approximately 500 facilities. This number should be updated to reflect how many buildings have been demolished, how many are in progress, and how many remain.
- Page 4-15, section 4.3, “River Corridor Cleanup Assumptions and Uncertainties,” includes an assumption that “Final RODs will confirm that cleanup levels established in the interim RODs are protective of human health and the environment. Additional work scope to address ecological receptors will not significantly impact cost or schedule.” That is a significant assumption. A range of impacts should be included if this assumption proves to be incorrect.
- The graphics that show remaining estimated cleanup cost by Work Element (as examples, Figures 3-4, 4-5, 4-8, 5-4, and others) do provide some useful information in a broad sense, but at the same time are very difficult to pull out anything more specific than a trend. While the detailed spending is available in Appendix E, it would be more useful to have that information available together. Perhaps some of that detailed information can be pulled from the Appendix into the body of the report so that it is adjacent to these otherwise generic figures.
- Figure 5.5 provides a graphic of the major Hanford groundwater plumes. In addition to this figure, it would be useful to have additional figures that show the groundwater plumes at each of the reactor areas and in each of the 200 Areas and the 300 Area.
- Table 5-4 shows groundwater operable unit remediation. The estimated period of remediation for several of these pump-and-treat systems seems unreasonably short.
- On page 5-39, the last bullet on the page discusses excavation depth in the Central Plateau. The last sentence says that “Excavation depths in the Outer Area would be up to 15 feet deep, to be consistent with remediation in the River Corridor.” That statement is not accurate, as there are many instances within the River Corridor where excavations have gone far deeper than 15 feet – especially when chasing a plume.

- On page 5-40, the last assumption listed is that “WIPP will remain operational through the end of Hanford Site cleanup operations that have the potential to generate TRU waste.” This is an issue that needs further exploration within this document. The topic provides an opportunity to demonstrate the necessity to ensure that these cleanup activities at Hanford are not dramatically delayed, because one of the impacts may be the need to extend the planned operating life of WIPP (at what would be a considerable cost), and that cost should be included in the document. With continued delays in the transuranic waste retrieval program, there is the potential for a major disconnect between Hanford cleanup and WIPP availability.
- The 2nd assumption for tank waste listed on page 6-16, which indicates the expectation that a national off-site geologic repository will be available to accept immobilized high-level waste from Hanford by April 2023 appears unrealistic. Plans and cost estimates should be included within this document that examine the construction of additional storage capacity for the immobilized high-level waste.
- The 8th assumption for tank waste listed on page 6-16 assumes the double-shell tanks will remain fully operational for the nominal 40 year waste treatment mission duration. We’re certainly hopeful that will be the case, but believe that this document should examine the potential of the inability to effectively use one or more double-shell tanks due to aging and potential leaks.
- Funding increases in the approximately 2019-2025 and 2038-2042 timeframes for Infrastructure Reliability Projects are not explained. The text should indicate what infrastructure improvement are expected to be necessary during these timeframes.
- While much work needs to be done through the Hanford Natural Resource Trustee Council to identify costs related to restoration and loss of use, this document should at least recognize this issue as a future cost and liability.
- In the “Range of Plausible Alternatives” for the 300 Area Groundwater (page A-13), the in situ installation of phosphate/polyphosphate treatment to sequester uranium in the vadose zone and groundwater is not likely to be effective. We recommend this alternative be deleted.
- In the “Range of Plausible Alternatives” for the Cesium/Strontium capsules (page A-18), using them for thermal generation of electricity/steam in future cleanup operations does not seem realistic, given problems that occurred when the capsules were leased for commercial use. We recommend this alternative be deleted.
- Alternatives for K Basin sludge other than processing at T Plant should be examined.

- TW-3 and other supplementary waste streams are overly reliant on disposing of wastes to on-site disposal facilities such as the Integrated Disposal Facility and the Environmental Restoration Disposal Facility. The site capacity and ability to handle mobile materials and the lack of waste forms dramatically limit the viability of such options. Other reasonable alternatives should be examined.
- All of the single-shell tank, double-shell tank, pipeline and ancillary facility alternatives rely on DOE being able to define high-level waste as something other than high-level waste in order to allow disposal at Hanford. In the event that this reclassification is not as broad as anticipated, other alternatives need to be examined, such as greater emphasis on retrieval of wastes for processing and disposal in a deep repository.
- Table A-5 lists the anticipated schedule for detailed analysis of cleanup action alternatives. “Disposition FFTF complex” is scheduled for more detailed analysis in the 2014 Hanford Lifecycle, Scope Schedule and Cost Report. We do not believe there is any urgency for this action and suggest it be pushed back for analysis. Any of the topics currently listed for further analysis in the 2015 Lifecycle Report would be a better substitute than FFTF.
- Appendix D, “Hanford Site Cleanup Decisions,” should include reference to Records of Decision which designate Hanford for disposal of off-site waste. This would include the February 25, 2000 *Record of Decision for the Department of Energy’s Waste Management Program: Treatment and Disposal of Low-Level Waste and Mixed Low-Level Waste; Amendment of the Record of Decision for the Nevada Test Site*, and the June 30, 2004 *Record of Decision for the Solid Waste Program, Hanford Site, Richland, WA: Storage and Treatment of Low-Level Waste and Mixed Low-Level Waste; Disposal of Low-Level Waste and Mixed Low-Level Waste, and Storage, Processing, and Certification of Transuranic Waste for Shipment to the Waste Isolation Pilot Plant*.
- In the tables in Appendix E which describe scope summary (as examples, Tables E-1, E-4, E-7, and others), it would be useful in the narrative to include estimates of dates (a range is okay) that this report assumes major cleanup activities. For example, in Table E-4 where it explains the KW superstructure and substructure demolitions, it would be useful in the “Scope Summary” narrative to include a target range of dates for these activities. The budget numbers on the following page (Table E-5), shows these activities are expected in 2015-2017. Going deeper into the budget, (Table E-6), superstructure demolition is planned for 2016 and substructure demolition 2016-17. Sometimes, however, the budget information is not quite as clear as in this example. It would make for better understanding of when specific projects are expected to occur if those target dates or range of dates was included in the narrative.

4. Washington State Department of Ecology

- 1) **Editorial:** P. ES-2, ¶ 5 last sentence states the cleanup schedule is from FY 2011 through FY 2090. In the President's budget submission for FFY 2012 for USDOE Environmental Management (Vol. 5), Overview, p. 18, the EM Project schedule range for Hanford is 2050 – 2062. Please explain that the Report extends the schedule 28 years because it includes long-term stewardship through 2090.
- 2) P ES-2, ¶ 6, sentence 1, states that the upper bound cost estimate is approximately \$115 billion. In Vol. 5 USDOE EM FY 2011 budget, Overview p. 36, the life cycle cost total range for Hanford is \$58,563 million to \$61,285 million and ORP is \$56,784 million to \$74,687 million (total upper range for Hanford + ORP = \$135,972 million) for 1997 through 2009, including prior year costs. In the FY 2012 report, please include the ranges for the total cost of cleanup as they appear in the FY 2012 EM budget submission (p. 17). The M-36-01A report addresses to-go costs from FFY 2011 forward; however, that amount would be more meaningful if it were placed in the context of total funds.
- 3) P. ES-4 described the lower bound for the reactor alternative analysis as interim safe storage followed by one-piece removal by 2068. That lower bound matches the USDOE's preferred alternative and the Record of Decision for the EIS, *Decommissioning of Eight Surplus Production Reactors* (DOE/EIS-0119F) on September 14, 1993. The description of the alternative analysis did not reference Sec. 4.4, where the summary of the alternative analysis appears. In the FFY 2012 and successive reports, please consider adding a reference to the discussion of the alternatives in the text (e.g., Sec. 4.4) in the Executive Summary.
- 4) P. ES-5 summarized the alternatives analysis for the 200-SW-2 Operable Unit. In ¶ 2, sentence 1, the text stated that reasonable alternative include the 200-SW-2 Operable Unit consists of 25 separate trenches. In the FFY 2013 and future reports, please provide a direct reference to the PBS where the summaries of the analyses appear and to the appendixes that provide more information on the analyses. Ecology suggests that future summaries of alternative analyses provide more explanation of the bases of dramatic differences in total costs and schedules for the alternatives (e.g., \$823 M versus \$16.6 B). For example, in the FFY 2011 Report Executive Summary in the, the estimated totals and the descriptions on p. ES-5 do not reveal that a 50% contingency totaling \$5.5 B raised the total cost of the upper bound from \$11.1 Billion to \$16.6 Billion because of uncertainties in addressing the topic in advance of the completion of the CERCLA investigation activities and RCRA closure.

- 5) P. 1-3, Sec. 1.3, sentence 3 states that the Federal budget cycle begins when DOE field offices receive fiscal year planning guidance from the President, DOE-HQ, and OMB. For the past several years, guidance has been late or never arrived (for example, the 2013 through 2017 guidance, dated July 8, 2011, arrived AFTER the budgets for 2013 went in and after RL had presented its budget at EM on 4/1/201). In the FFY 2013 report and beyond, please add the approved baselines that RL and ORP use for work in the near term. The approved baselines include all of the compliance commitments for RL and ORP. They reflect all of the components of cleanup within RL and ORP PBS's. The approved baselines tie estimates with approved work scope. The details of the authorized baselines appear in the approved building blocks (ABB's) that represent specific work within each project baseline summary (PBS). The ABBs have become the bases for discussions with the regulators and the public as part budget development process. Please revise the text to add a brief discussion of the ABBs and approved baselines with respect to submissions of annual budget requests.
- 6) P. 1-10, ¶ 2, last sentence makes reference to "...dozens of inactive storage tanks..." The statement is confusing because the USDOE considers the SSTs as inactive, as well as other miscellaneous underground storage tanks. The State regulates the SST's as non-compliant tanks actively storing mixed waste. Please clarify what the dozens of inactive storage tanks are.
- 7) P. 1-11 through 1-14, Sec. 1.5 is a useful addition to the FY 2011 report because it recounts the USDOE's understanding of the provisions of Milestone M-036-01. Ecology recommends that the information appear in each report henceforth.
- 8) P. 1-16, Table 1-4, please update River Corridor Cleanup Actions to remove two bulleted items: "Restore 100-KR-4 Groundwater OU to Beneficial Use." and "Restore 100-HR-3 Groundwater OU to Beneficial Use." Specific goals are in place to clean up the groundwater to aquatic water quality standards.
- 9) P. 2-2, Sec. 2.1.2 In the FY 2013 report, please include a discussion of the Activity Building Blocks in the description of the project formulation process and explain how they tie discrete pieces of work in a PBS. Include a discussion of approved project baselines so that the public understands that a process is in place to fund specific tasks within a PBS and that the PBS control point is at the "top" of the budget "pyramid". For illustrative purposes, abstract one of the RL PBS's from the FY 2013 EM Budget Guidance letter, Attachment D (11-PIC-0036).
- 10) P. 3-2, Table 3-1, PBS RL-0013C General Scope: Please revise. Please add the following text: "The USDOE has agreed that the Hanford Site will not receive waste from other sites at least until the Waste Treatment and Immobilization Plant is operational. [12/31/2022]"

- 11) P. 3-3, Sec. 3.2, ¶ 1: Revise Tank Waste Cleanup to complete by 2050 to 2052 or specify “Complete pretreatment processing and vitrification of high and low activity waste by 12/31/2047 (MM M-062-00) and M-045-00A Complete closure of Double Shell Tanks by no later than 9/30/2052”. The detailed schedules show TPA MS M-62-00 and M-45-00A completion dates are the most extended to date).
- 12) P. 3-3, Sec. 3.2, ¶ 1: Cleanup on the Central Plateau is forecast to be complete by 2066. The Record of Decision for the 200-ZP-1 Operable Unit indicates that this remedy must be in place and under active management past 2066 (for a total of 125 years). Please revise the FY 2013 report to show that Central Plateau groundwater remedies will extend past 2066.
- 13) P. 3-3, Section 3.3: For the FY 2013 report, please consider adding the total life cycle cost ranges for cleanup for RL and ORP. See p. 17 in Vol. 5 EM of the FY 2012 budget submission.
- 14) P. 3-5, Figure 3-3: Duration of ORP project is 2050 in figure. TPA MMS M-42-00A requires completion of DST Tank Farm closure by end of M-62-45 plus 5 years, or no later than 9/30/2052. Please extend the ORP Project duration through 9/30/2052.
- 15) P. 3-6, Figure 3-4: Please extend ORP-0014 through 9/30/2052.
- 16) P. 3-6, Figure 3-4 and parallel figures 4-5, 4-8, 5-4, 5-9 et al. Please list the applicable tables in Appendix E that list specific \$ totals. The colored three-dimensional graphic is eye-catching but very difficult to use. The reader can see increases and decreases in funds pictorially, but the actual details are too small to evaluate. A reader interested in the detailed information must review Appendix E.
- 17) Table 3-2 For the FY 2013 report, please consider adding the total life cycle cost by PBS. Please use the ranges that appear in the USDOE FY 2012 budget request, volume V, EM, pp. 31 – 32 for Hanford and pages 35-36 for ORP.
- 18) P.3-8 Sec 3.4 cites the requirement in TPA MS M-036-01 that allows the DOE to include costs other than directly related to environmental obligations. The text states that the 2011 Lifecycle Report treated all costs (including obligations such as safeguards & security) as directly related to environmental obligations. Ecology continues to assert that the costs for safeguards and security, surveillance and maintenance, and site services should be separate from cleanup. Ecology appreciates that details of Safeguards & Security, Regulatory Support, and Long-term Stewardship appear in Chapter 7. Ecology also appreciates that Table 3-2 contains estimated cleanup costs for RL-0020 (S&S), Richland Community & Regulatory Support (RL-0100) and long term stewardship

(RL-LTS) appear in Table 3-2. The costs for RL-0040 site-wide services, ORP0014 Project support, ORP—60 Plant Wide are not clearly defined. We ask that RL and ORP present those work elements in detail, as ~~have the~~ other work summaries appear.

- 19) P. 4-1, Sec. 4.0 RIVER CORRIDOR CLEANUP, ¶ 2 states “The majority of RC Cleanup is on track for completion by FY 2015.” In the FFY 2013 report, please revise the statement to say “The HFFACO Action Plan Appendix D. Major Milestone M-016-00 requires the USDOE to complete remedial actions for all non-tank farm and non-canyon operable units by 09/30/2024. Many of the River Corridor Cleanup interim remedial actions that appear in Table 4-1 will be complete by 2015, when the current Closure contract ends. Final remedial activities may extend until 09/24/2024.”
- 20) P. 4-2 Please add M-016-00 to Table 4-1.
- 21) P. 4-1, Sec. 4.0 ¶ 2 states that work related to the 100-K Area is scheduled for completion by 2024, in conjunction with RL-0012 and RL-0013C. Ecology requests that the USDOE revise sentence 2 as follows: “Work related to the 100-K Area is scheduled for completion in 2024, per HFFACO Major Milestone M-016-00.”
- 22) P. 4-2, Table 4.1 contains the milestone numbers, titles, and compliance dates. Ecology requests that the USDOE add major milestone M-016-00 to Table 4-1 in the FY 2013 LCSSCR.

Ecology requests that the USDOE correct the compliance date for Milestone M-016-00C to show 12/31/2020 in the FY 2012 LCSSCR.

Ecology requests that the USDOE correct the title of M-016-74 in Table 4-1 to include “... “ inside the fence waste sites north of Apple Street...” in the FY 2012 report.

Ecology requests that the USDOE add the M-016 milestones that the Tri-Parties added in FY 2011 to address the 100 K Area sludge removal (including knock out pot containers), and deactivation, and demolition and removal of the 105-KW Fuel Storage Basin in Table 4-1 in the FY 2013 report,. These milestones include M-016-170/171/172/173/174/175/176/178/181/186/187, M-093-26/27.

In Table 4-1 in the FY 2012 report, Ecology requests that the USDOE update MS M-016-00C language and insert the milestone due date (12/31/2020).

In Table 4-1 in the FY 2012 report, Ecology requests that the USDOE update the compliance date for MS M-094-08 to 06/30/2012.

In the FY 2012 report, please revise Table E-22, Nuclear Facility D&D- River Corridor Closure (100-K Area Remediation) to reflect completion of the 100-K remediation by Qtr 1 FFY 2021 (e.g., show increased costs for remediation prior to FY 2022, rather than in FFY 2022, 2023, and 2024).

In the FY 2012 report, please adjust totals in Figure 4-4 to reflect increased funding prior to 2022 and 2023. Please revise Figure 4-5 to include 100-K Area Remediation.

23) P. 4-3, Sec. 4.1 states that the River Corridor Closure Project established certain closure objectives. Remediation of 618-10 and 618-11 by 09/30/2015 is part of TPA MS M-016-00B. Completion by 9/30/2015 does not appear as a specific requirement of the completion strategy in DOE/RL-2009-10. Please revise the text of the cleanup objective to explain that the cleanup of 618-10 and 618-11 by 09/30/2015 is part of the interim remedial actions that the USDOE must complete per Milestone M-016-00B by 09/30/2018.

24) P. 4-4, Table 4-2. Reactor Status: In the FY 2012 report, please revise N Reactor remaining activity to change 2013 to 09/30/2012 per TPA MS-093-20.

25) P. 4-8, Figure 4-4 Remaining Estimated Costs by FY shows approximately \$550 million in FFY 2011. The administration requested a total of \$386,028,000 and the RL received \$351,028,000 in appropriations. For FY 2011, the reader must assume that the difference in funds is either due to a carryover from prior years OR receipt of Recovery Act funds. Designating the base and Recovery Act funds in 2011 would better illustrate the contribution from the Act.

26) Figures 4-5 (RL-0041), 4-8 (RL-0012), 5-4 (RL-0011), 5-9 (RL-0030), 5-12 (RL-0041), 5-15 (RL-0042), 5-18 (RL-0013C) all show Site-Wide Services. Appendix Tables E-1 (RL-0011), E-4 (RL-0012), E-7 (RL-0013C), E-12 (RL-0030), E-15 (RL-0040), E-19 (RL-0040 Infrastructure and Services), E-21 (RL-0041) E-24 (RL-0042) contain a standard description of the work elements designated as Site Services (“...includes proportional share of indirect costs for site services and infrastructure, add, and other direct costs.) In the FY 2013 report, please add specific information about what “indirect costs” and “other direct costs” include in Chapter 3.0 in Section 3.4.

In Section 3.4, please add a table that shows all Site Services costs together (by RL PBS) and as a percentage of the total cost for each PBS to aid the USEPA and Ecology in understanding how Site Services affects the total costs.

In the FY 2013 report, please add the same information on Site Services direct and indirect costs to Chapters 4.0 for PBS RL-0012 and 5.0 for PBS RL-0011/0030/0040/0042/0013.

Please provide information in ORP-0014 in sufficient detail for Ecology to determine the costs for Site Services that are levied on the Tank Operations Contract work.

27) P. 4-9, Figure 4-5: The cost scale (\$0 – 200 M) is too small to see actual totals for work elements. Please add a reference to Appendix Table E-22 after the Table 4-5 Title and/or provide totals in another table.

Please explain why the work elements in Figure 4-3 and Table 4-3, and the element totals in Table E-22 do not match the Richland Authorized Building Block totals that appear in the FY 2011 ABB list that RL provided on the Hanford Budget web page (dated 06/12/2009). Direct correlation of the ABB with the Level 2 Scope Summary is not possible. Please reconcile the ABB and the Work Elements.

28) P. 4-10, Sec. 4.2 references six main work elements then presents a schedule for each in Figure 4-6 on p. 4-11, a scope summary for each in Table 4-4, and details of estimated costs for the six elements plus Site Services in Appendix E, Table E-6.

As is true with other PBS's in the Lifecycle Report, a reader cannot correlate the six main work elements and their totals to the RL FY 2011 ABBs. Some correlation between the FY 2011 RL ABB list and the six main work elements is necessary.

29) P. 4-12, Table 4-4 does not list Site Wide Services. Site Wide Services appears in the RL ABBs for FY 2011 and in Appendix E Tables E-4 and E-5 for PBS RL-0012. Please add to Table 4-4 in the FY 2013 report.

30) P. 4-15, Sec. 4.4 states that the National Park Service is evaluating B Reactor for inclusion in the Manhattan Project National Historical Park. In the FY 2012 or 2013 report, please update the information. Please add the recommendation that Sec. of the Interior made to the US Congress to establish the Manhattan Project National Historical Park (including B Reactor) on July 13, 2011. In addition, please add any Congressional action on the recommendation.

31) P. 4-15 assumptions for PBS-0012 include the assumption that T Plant is acceptable for sludge storage and no pretreatment is necessary before transfer. Figure 4-6 shows a schedule for the sludge treatment project that ends at the FY 2019. Page 5-34, Figure 5-16 shows T Plant operation through ~ FY 2054. If T Plant is placed into standby mode for FY 2012 through FY 2015, please address the impact on the sludge treatment project end date. Please discuss the T Plant safe standby through 2015 impact on an early start (2025) for the 30-year implementation of the upper bound reactor dismantlement option.

- 32) P. 5-1, last ¶ states that the goal of the groundwater portion of the Central Plateau cleanup effort is to restore the groundwater to its beneficial uses. The text does not provide specific milestones or provisions in the settlement that support the assertion. In the FY 2013 report, please amend the paragraph to include specific milestones in the text or reference the milestones in Table 5-1.
- 33) P. 5-4, Table 5-1, Milestones M-091-01A and -01B text is incomplete. The M-091-01A text deletes the requirement to "... submit a milestone change package documentation (based on the conceptual design) for annual construction milestones for the planned facilities necessary for retrieval, storage, and treatment/processing, of all Hanford Site RH TRUM waste and large container CH TRUM waste." Please add the text in the FY 2013 report.
- The text for M-091-01B omits the additional requirement "In addition, submit a milestone change package documenting any substantial variations, based on the definitive design, from annual construction milestones finalized pursuant to M-091-01A." Please add the text in the FY 2013 report.
- 34) P. 5-4, Table 5-1, Milestone M-091-043 text is incomplete. Please add "...to applicable LDR standards in compliance with WAC 173-303-140." after "... retrievable storage."
- 35) P. 5-5, Table 5-1 "Soil and Water Remediation – Groundwater /Vadose Zone, PBS RL-0030" does not list the specific milestones that the Tri-Parties established for groundwater remediation (not including target milestones). If they are not already in the FY 2012 Table 5-1, please revise the soil and groundwater remediation – groundwater/vadose zone milestone list to include the specific milestones that apply to groundwater (e.g., Change Form M-015-09-02/M-15-110A).
- 36) P. 5-8, last sentence: The text states that the ARRA funding accelerated the work scope. That acceleration in turn contributed to initial peaks in the work scope funding. The text then makes a general statement that costs decline for the remainder of the lifecycle. That generalization does not address the drastic reduction in costs for FY 2012. Please add a more specific explanation that addresses reasons why efforts to disposition PFP halt for one year then resume.
- 37) P. 5-11, Sec. 5.2, last ¶, sentence 1 lists cyanide as a major chemical contaminant in Hanford Site groundwater. The map of the major Hanford groundwater plumes does not show the cyanide plume. Please add the cyanide plume in 200-BP-5 to Figure 5-5.
- 38) P. 5-15, Figure 5-6 footnote lists 200-ZP-2. Please change name to 200-PW-1 to reflect change that text contains on P. 5-14 within discussion of 200-ZP-1.

- 39) Page 5-19, Table 5-4 lists 200-ZP-2. Please change name to 200-PW-1 to reflect change that text contains on P. 5-14 within discussion of 200-ZP-1.
- 40) Page 5-22, Table 5-6 Soil Flushing, Reason for Treatability Testing In the FY 2012 report, please revise the text as follows: “Under consideration as a potential mechanism...” The Tri-Parties are considering soil flushing; however, Ecology has not agreed to testing soil flushing yet. No testing is underway or planned to date.
- 41) P. 5-27, Section 5.4: ¶ 3 In the FY 2013 Lifecycle report, please update the description of the FFTF containment building final closure to reflect the USDOE’s preferred alternative and the subsequent Record of Decision.
- 42) P. 5-29, Figure 5-12 shows Site-wide services – RL-0040 shows three work elements in Figure 5-10 Schedule and in Table 5-7 Level 2 Scope but four scope work elements in Figure 5-12 (including Site-wide Services). Table E-15 that lists the Level 3 Scope Summary includes Site-wide Services as does Table E-17, which shows that Site-wide Services will total \$165,118,000 between 2011 and 2016. Table E-16 shows the remaining cost for Site-wide Services to be \$2,628,445,000, an amount almost equal to that of regulatory decisions at \$2,646,872,000. Please add Sitewide Services to Table 5-7.
- 43) P. 5-32, Figure 5-15 shows funds for FFTF Site-wide Services, but a description of the Work Element does not appear in Table 5-8 or on the schedule in Figure F-13. Please add a scope description for FFTF Site Services in Table 5-8 and a schedule line in Figure 5-13.
- 44) P. 5-33, Sec. 5.5 ¶2 Solid Waste Stabilization and Disposition – 200 Area lists one of the additional objectives as developing alternative methods of treatment and disposal of orphan waste. On P. 5-35, Table 5-9, descriptions of the functions of the CWC/T Plant/WRAP/200 Area LETF do not include orphan waste treatment and disposal. Please amend the appropriate work elements and scope descriptions to include orphan waste treatment and disposal in Table 5-9.
- 45) Page 5-36, Table 5.9: Please add a brief description of Site-wide Services RL-0013C (similar to that in Table E-7).
- 46) **Editorial** Page 5-38, Figure 5-18 shows the estimated clean-up costs by Level 2 work element; however, the order of the elements does not match the order in Table 5-9 or Appendix E Tables E-7 and E-8. The disparity in order makes visual comparisons difficult. In the FY 2013 report, please reorder the Level 2 Work Elements to reflect the order of the scope summaries and the estimates.
- 47) P. 5-39, Sec. 5.6 ¶ 3 introduces the assumptions that the USDOE made for PBS RL-0040 D&D – Remainder of Hanford. In the first bullet, the report states that the industrial worker scenario will define the exposure scenarios and the threshold cleanup levels for waste sites in the 200 Areas. The first bullet then

adds a parenthetical explanation that DOE/RL-2009-81 assumes an industrial worker scenario for the Inner Area and a rural residential scenario in the Outer Area. Ecology's views differ from those that the USDOE used in the LCSSCR and align more closely with the assumptions in DOE/RL-2009-81. Ecology supports the use of the industrial worker scenario for the Inner Area and rural resident scenario for the Outer Area. In the FY 2013 report, please address the State's assumptions.

For the LCSSC Report, Ecology agrees that the USDOE may use 15 feet below grade for the depth of excavations that is in the 5th bullet but only to calculate costs and schedules. As part of the planning for a specific remediation effort, the USDOE and the regulatory agencies will determine the depth of excavation that will be necessary to remediate a waste site to ensure protection for humans, the environment, and the groundwater. In the FY 2012 report, please add a statement that the depth of excavation will be determined when the Parties plan a t specific remediation measure.

48) P. 6-1, ¶ 2 states that the River Protection Project (RPP) must retrieve, treat and dispose of 53 million gallons (Mgal) of tank waste. ORP-11242 Revision 4 states that 57 million gallons (Mgal) must be retrieved, while Revision 5 states that 56 Mgal must be retrieved. In the FY 2013 report, please use total quality waste to retrieve as of 07/30/2012. Hallelujah

49) **Editorial:** P. 6-1, ¶6 states that six facilities, called canyons, served as separations facilities. Per the description of canyons on the Hanford web page, only five (5) canyons served the original objective: separation of plutonium from irradiated fuel <http://www.hanford.gov/page.cfm/CanyonFacilities>. They included B, T, U, REDOX, and PUREX. PFP or Z Plant housed the end of the process where the liquid plutonium nitrate solution underwent processing to become solid plutonium or plutonium oxide powder <http://www.hanford.gov/page.cfm/PFP>. Please revise the statement to list 5 canyons and one facility that solidified the liquid the others produced.

50) P. 6-2, ¶ 2 described past practices in which supernate underwent evaporation but did not include the interim stabilization. Interim stabilization came to be governed by a consent order because the schedule for stabilization was not sufficient to protect the environment. Please insert a brief description of interim stabilization (similar to that on P. 6-8 Sec. 6.1 ¶ 1).

51) P. 6-2 ¶ 4 3rd bullet states that the current strategy will be to develop and deploy supplemental treatment capability to treat the two-thirds of the Low Activity Waste (LAW) fraction. Figure 6-1 shows "2nd LAW Waste". Neither

location specifies what the supplemental treatment will be. Please insert the assumption that supplemental treatment will be the same as the LAW vitrification process will be in the existing LAW (matching assumptions on P. 6-16 in bullet 4).

- 52) P. 6-7 Table 6-1 lists TPA Milestone M-062-45-ZZ. That milestone does not appear in Hanford Federal Facility Agreement and Consent Order, Attachment 2 Action Plan Appendix D. Reference to the submittal of a one-time supplemental treatment selection and milestones appears in M-062-040 Supplemental Treatment item 3. In the FY 2013 report, please revise the Table 6-1 Milestone to delete M-62-45 ZZ.

Please add TPA Milestone M-62-40 “ DOE shall submit a one-time Hanford Tank Waste Supplemental Treatment Technologies Report, which will be required if a tank waste supplemental treatment technology is proposed, other than a 2nd LAW Vitrification Facility.” Compliance date: 10/31/2014.

- 53) P. 6-7 Table 6-1 Please add the following TPA Milestone M-62-40 “ DOE shall submit a one-time Hanford Tank Waste Supplemental Treatment Technologies Report, which will be required if a tank waste supplemental treatment technology is proposed, other than a 2nd LAW Vitrification Facility.” Compliance date: 10/31/2014.
- 54) Page 6-7 Table 6-1 does not include any of the M-47-00 milestones that govern management of secondary waste. In the FY 2012 report, please add M-047-00 and M-047-06 to Table 6-1.
- 55) Page 6-9, Table 6-2 Please add work element Secondary Waste Treatment with a scope description.
- 56) PP. 6-12 & 6-13, Sec 6.2 Figure 6-7 presents a schedule for the “Plant Wide” work element. Table 6-3 describes “Plant Wide” as cross-cutting services and equipment that is provided to the construction site. In the FY 2013 report, please expand the Table 6-2 “Plant Wide” description to explain more fully what “cross-cutting services and equipment” includes. Please indicate whether the category includes an estimate of site-wide services (e.g. fire protection, electricity, water), costs for rental of construction equipment (e.g., large cranes), or costs for security.
- 57) P. 6-13 Table 6-3 does not contain a work element or a work summary that describes the activities that will be necessary to ensure integration of waste retrieval/transfer in the Tank Farms with the commissioning and operation of the WTP. Please add a work element for the integration effort in the ORP-0060 in Table 6-3.

- 58) P. 6-16, Sec. 6.3 ¶ 2 bullet 1 states that the cesium and strontium capsules will not be processed in the WTP. In contrast, Chapter 5 Table 5-1 (P. 5-5) lists TPA MS M-092-05. That milestone requires the USDOE to determine a disposition path and establish interim milestones for Hanford Site cesium/strontium capsules by 6/30/2017. Please provide more information about the bases for the ORP assumption and add any tentative or final agreements among the Tri-Parties to delete the M-092-05 or declare it complete.
- 59) P. 6-16 assumptions include the assumption that CH TRU treatment and processing capability will be available in FY 2015 to support TRU tank retrieval. In addition, another key assumption is that packaged CH TRU waste will be interim stored onsite in the CWC. Ecology disagrees with any assumption that HLW tank waste may be designated as TRU waste. Please address this issue in the FY 2013 report.

In addition, Rev. 4 of the system plan contains different assumptions than those that appear on P. 6-16 of the FY 2011 Lifecycle Report. Per System Plan Rev 4 Sec. 5.5.1, a supplemental TRU treatment facility will support beginning CH-TRU processing in FY 2018 and ending processing in FY 2022. Rev 4 Section 5.7 Disposal Offsite Sec. 5.7.1 states that ORP will begin shipments of 7,491 drums of CH-TRU to WIPP no sooner than April 2018 and finish no later than May 2022. Rev. 4 does not specify that CWC will provide interim storage (which appears in Figure 1-2 Simplified Process Flow Diagram). In contrast, System Plan Rev 5 shows supplemental TRU treatment and includes interim storage at CWC (Figure ES-1 and Table ES-1). In the FY 2013 report, please add a table that outlines the changes in the System Plan from the FY 2012.

- 60) P. 16, Sec. 6.3, 4th bullet states that supplemental treatment will be provided by a second LAW vitrification facility located adjacent to the WTP. In the FY 2013 report, please continue to assume that supplemental treatment will be 2nd LAW. Ecology does not support the assumption that other form of technology will provide supplemental treatment as an option in the LCSSCR.
- 61) P. 16, Sec. 6.3, Revise 9th bullet: Please insert the following new sentence before the existing text in the 9th bullet. Add sentence: "The 242-A Evaporator is a critical resource." Please discuss the risk of loss of the 242-A Evaporator in terms of a single point failure.
- 62) Page 6-17 Sec. 6.3, 3rd bullet lists the assumption that the official WIR determinations will be consistent with the assumed disposition of the primary and secondary waste forms before their disposition. Ecology suggests that subsequent revisions of the Ch. 6.0 Assumptions list the modification of the

WIPP permit to accept Hanford tank waste as TRU waste among the uncertainties.

- 63) P.6-17, Sec.3 6.4,th bullet: Please add the following new text before existing text:
“The cross-site transfer system is a critical resource. The cross-site transfer system will operate as needed through the life of the mission.”
- 64) Pages 6-16 and 6-17 do not include any assumptions about the treatment of secondary waste from WTP tank waste treatment. Please address WTP secondary waste treatment and include assumptions in the FY 2012 report.
- 65) P. 7-2 Sec. 7.1 ¶ 2 discusses the Safeguards and Security funding profile in Figure 7-3. The text states that the initial drop in cost after the initial peak correlates with the completion of the initial remedial actions for non-tank farm and non-canyon operable units. Another abrupt decrease appears in Figure 7-3 (in 2039), but the text contains no explanation. In the FY 2013 report, please add an explanation for the second drop in 2039.
- 66) P. 7-4, Sec. 7.2 RL Community and Regulatory Support ¶ 3 states the drop in costs is related to the end of grants following completion of actions for all non-tank and non-canyon Operable Units. Costs extend to 2060. This assertion appears to contradict Figure 5-10 where the Zone Environmental Remediation time line extends to FY 2065 and Table 5-7 that describes the Zone Environmental Remediation as geographic remediation of closure zones in the Central Plateau. In the FY 2013 report, please extend regulatory support to 2065 to match the schedule for zone environmental remediation and recalculate the costs to recognize that extension in the schedule.
- 67) PP. 7-6 & 7-7, ¶ 4 states that in FY 2012, Real Estate and Site Planning will be planned in the other elements of RL-0040. Please clarify where the Real Estate planning for the River Corridor will appear in FY 2012.
- 68) GENERAL – the scope of LTS is ambiguous. It must be more precise to support a \$4 billion cost estimate.

Revise the description of LTS to address the following issues:

- A. Move “Institutional Controls” out of this section because text refers to “Institutional Controls AND Long Term Stewardship” – with the implication that they’re two separate work elements. Ecology agrees with the separation into two separate work elements – ICs are specified in the remedy and should be described in the costs for River Corridor Cleanup and Central Plateau Cleanup.
- B. Similarly, surveillance and maintenance of engineering controls is specified in the remedies and should be described in the costs for River Corridor Cleanup and Central Plateau Cleanup.

- C. The “Waste Management” scope as defined in Table 7-4 is part of the remedy implementation because it includes groundwater treatment. This should be described in Section 5.2 of this report, not in LTS.
- D. Some of the “Site and Environmental Monitoring” is associated with monitoring groundwater remediation and should also be described in Section 5.2.
- E. Delete reference to the “Hanford Site LTS Program” because this text refers to it as “when created.” Text should not refer to a Program that does not exist.
- F. The reference to the CLUP is outside of the scope of the CLUP ROD, which allows DOE to plan land use for at least 50 years. Upon “completion of Hanford Site cleanup actions,” the Hanford Site will presumably have no mission, so the authority of the CLUP will lapse. Constrain the reference to the CLUP to “until cleanup completion” and delete the phrase “In addition to managing the post-cleanup completion obligation” in conjunction with the CLUP.
- 69) P. D-2 In the FY 2013 report, please ensure that the Hanford Site RCRA permit title reflects Rev. 9 that the State will issue (*Hanford Site Dangerous Waste Permit Rev. 9*)
- 70) P. D-23 Permit ST 4507. Please revise the description to state that permit has expired but remains in active status pending imminent closure of 100 Area facilities. The permit will not be renewed for the 100-N system. The USDOE’s contractor is submitting an application for a replacement system that will lie in the 600 Area, immediately outside of the northeast corner of 200 West Area. That system will require a separate permit.
- 71) MS-036-01A states “...Costs shall be displayed by program baseline summary. Additional levels of detail will appear in the appendixes of the report.... Reporting in the appendixes will typically be one level below the PBS for the lifecycle, and at levels below that for two to five years beyond the execution year (usually at the activity level within the budget assigned to a specific project, e.g., RL-0011, WBS element 011.04.01, Nuclear Material Stabilization and Disposition – PFP, Disposition PFP, Transition 234 5Z)....” Appendix E contains tables that display varying levels of detail; however, they do not all display the information with a designation of the WBS level. Without WBS structure, Ecology cannot determine if the information in the Appendix E near term and life cycle table reflects the approved WBS. Please include the approved WBS structure for RL and ORP in the FY 2013 report.
- 72) P. E-5 Table E-3 NM Stabilization and Disposition PFP Near-Term Schedule and Costs, Level 3, by Fiscal Year shows the Total for FFY 2012 as \$48,371,000. The

FY 2012 request to Congress totaled \$ 48,458,000. Please explain the disparity in the totals or replace the FFY 2012 total in the table.

Also in Table E-3, Transition 243-Z stops in FFY 2012 then resumes and finishes in FY 2013. Perhaps an explanation would be appropriate to explain why a task that costs \$1.115 million cannot be funded and completed in 2012, given facility system and components increases from \$9.6 M in FY 2011 to \$10.4 M in FY 2012 when dispositioning halts then returns to \$9.4 M in FY 2013 when dispositioning resumes. Ecology is interested in understanding more about the work that is in the facility system and component scope in FFY 2011 and 2012.

73) Table E-6 SNF Stabilization and Disposition Near Term –

74) Page E-14 Table E-7, Integrated Disposal Facility IDF Regulatory and Safety, contains a description of work that includes regulatory support including performance assessment. The presentation of the budgets that appears on Pages E-24 and 25 in Table 9 following presents a total for IDF regulatory and Safety that does not present costs for the activities separately. Please provide Ecology the schedule and cost for conducting a performance assessment of the IDF.

75) Page E-15 Table E-7, Low-Level and Mixed Low Level Waste Level 3 work element does not include Regulatory and Safety that would include performance assessment. The 200-SW-2 remediation cost estimate concentrates on the costs to cap the burial grounds and to dig up the burial grounds. Please provide Ecology information about regulatory and safety budget for the burial grounds, including the schedule and cost of a performance assessment of the burial grounds.

76) Table E-11 Safeguards and Security costs reflect a significant decrease from FFY 2038 to 2039. Please add a note that reiterates the cause for the reduction. The last estimate appears in 2060. That would presume that Long-Term Stewardship will **not require S&S. Please so state or revise the schedule.**

77) Page E-31 Table E-12 Deep Vadose Zone Operable Unit Scope Summary states that initial action planned for the OU will be addressed in the future. Pages E-33 and E-34 Table E-13 show budget from FFY 2019 through FFY 2029. In the FFY 2013 report, please provide information about the bases for the duration of the Deep Vadose Operable Unit effort and the technical bases for the cost estimates.

78) Pages E-14 – E-16, Table E-7 Level 3 Scope Summary does not contain information in the T Plant, LETF, or WRAP scope that includes development of alternative methods of treatment for orphan waste. In the same table, scope that includes alternative methods of disposal is not in the IDF, LLMW trenches,

or ERDF scope. Please add the information to the scope summaries of the appropriate work element scope.

- 79) Table E-8 Capsule Storage and Disposal shows significant increases in FY 2015 and 2016, but the decision on disposition does not occur until 06/30/2017. Please provide more information about the increases in FY 2015 and 2016 within Table 5-9 or on page 5-33 (WESF upgrades?). Capsule Storage and Disposal costs rise again in FY 2024 and 2025 but no explanation appears in Table 5-9. Please explain the increases. Table E-8 shows no costs from 2031 through 2037 for Capsule Storage and Disposal, then small costs in 2038, 2040, 2043, and 2045. Figure 5-16 shows the remaining cleanup schedule for Capsule Storage and Disposal in two parts, with the first ending in 2031. The second begins in 2038 and ends in 2045. Please provide more information about the work planned for 2038 through 2045 that will require intermittent funding. Please include estimated dates for WESF D4 if available.
- 80) Pp E-44 through E-45, Table E-14 does not contain cost information sufficient for Ecology to determine when RL will conduct performance assessments of the Low Level Burial Grounds or the Integrated Disposal Facility. Please provide the schedule and costs to Ecology.
- 81) P. E-33 and E-34, P. E-38 show that the remediation of the Deep Vadose Zone Operable unit is scheduled for funding and completion beginning in FFY 2019 and ending in FFY 2029 using a total of \$255.6 Million. Please provide Ecology more information about the bases for RL's assumptions of schedule and cost.
- 82) Pages E-75 through E-76 Table E-31 and Pages E-77 through E-78 Table E-32 In the FY 2012 report, please add Work Element "Secondary Waste Treatment." Please provide Level 2 Schedules and Costs in Table E-31 and Level 3 Near Term Costs and Schedules for Secondary Waste Treatment.
- 83) PP. E-79 Table E-33 and PP. E-80 through E-83 Table E-34 Please add costs and schedules for the work element that describes the activities that will be necessary to ensure integration of waste retrieval/transfer in the Tank Farms with the commissioning and operation of the WTP.
- 84) Page F-3, Sec. F.2. Last ¶. Ecology endorses the assumption that the lower bound included continued cap maintenance and monitoring.
- 85) Page F-6, Sec. F.2.2 Group 3 wastes: The description states that Group 3 wastes have no readily identifiable handling or processing methods at the Hanford Site and require negative pressure containment structures to support waste retrieval and conditioning. They are assumed to be in the burial grounds and retrievable. Ecology requests that the USDOE insert more information about the assumptions

about Class 3 wastes that form the bases of the estimates (e.g., 1940's and 1950's wastes in caissons, waste residues in PUREX tanks, dispersible waste forms resulting from past operations) into the LCSSC Report. References to the PFM-00011 are not sufficient because the document is not readily accessible.

- 86) Page F-6 Group 2 (Cost Model 2) wastes are TRU wastes in volumes are said to be based on historic costs or current estimates for comparable Hanford Site activities. In the assumptions for the Solid Waste Stabilization and Disposition is a statement that T Plant will be available for modification to be the facility that will house retrieval, storage, and treatment/processing of all TRUM waste. Please clarify when the upgrades required for M-91 will begin, the duration of the project to upgrade the facility, and the estimates for the upgrades by year.
- 87) Page F-7, Sec. F.2.2 Table F-3: The highest volumes of Group 3 wastes are said to be in the TSD Unit Landfills. The USDOE assumes that handling and processing methods for these wastes are not yet in existence. This would imply that the waste cannot be disposed; thus, the upper bound estimate does not fully estimate the cost to remove/treat/dispose of all of the waste in 200-SW-2. The reference to the rough order of magnitude estimate (PFM-00011) is insufficient. Please add more information because the document is not readily accessible for the public.
- 88) Page F-9 Table F-4: It is not clear whether the 50% Cost and Schedule Uncertainty includes the costs that the USDOE will incur to develop treatment methods for the Group 3 wastes that are TSD wastes-. Please clarify whether the uncertainty includes an estimate for development of such treatment methods.

5. Liz Mattson, Hanford Challenge Program Coordinator

Thank you for creating an opportunity to provide comments on the 2011 Hanford Lifecycle, Scope, Schedule and Cost Report (the Report). We appreciate the many briefings you have provided the Hanford Advisory Board, both in committee and via webinar and your patience in answering questions related to the Report. We believe that the Report is and will continue to be, in its future iterations, a useful document, especially as it provides a window into the remaining cleanup work at Hanford. It is important both as a project planning and budgeting tool and for framing discussions with involved stakeholders and the general public about the challenges ahead and the assumptions underpinning the remaining cleanup.

Hanford Challenge has a few concerns with the report and how it may be interpreted and used.

Though not a decision document, we believe the Report will have an impact on decisions through a lens of cost comparison. Our concern is that the planning emphasis will be on how the remaining cleanup costs may be reduced, instead of an emphasis on how DOE may achieve

the most protective cleanup current and future generations deserve, by considering and comparing the cost ranges that could produce a more protective outcome. As it is an accessible document, it can be assumed that this will be a go-to document for decision makers when assessing the future of cleanup amidst budget concerns. Though we have heard DOE say the Report is not intended to argue cost against protectiveness, decision makers are under pressure to save money. No one wants less protective remedies chosen because a planner or decision maker has seen numbers that argue for a less expensive cleanup. For example, having decision makers see a range of costs coupled with alternatives instead of the highest and lowest cost for the remediation of the 200-SW-2 OU will provide a more tempered reaction to the cost and remediation possibilities for that OU (Operable Unit), instead of only seeing the shocking upper bound cost for removal, treatment and disposal. Providing additional remediation options for OUs like this, instead of only showing the use of barriers versus complete RTD (Retrieval, Treatment and Disposal), will increase planning flexibility and transparency. DOE often says “the decision has not been made” for waste sites that do not have a final ROD (Record of Decision) in place. Yet seeing cost estimates like this, which push a conclusion that the protective decision is too expensive, does not build public confidence that that is the case.

Hanford Challenge believe that providing a clear picture of how budget shortfalls or project delays will affect future schedules and scope of work should be reflected in a range of total estimated cleanup costs. Instead of giving remaining cleanup a final \$115 billion price tag, it would be more useful to provide a range of costs using a range of cleanup scenarios. This range should take into consideration the guaranteed need for long-term stewardship beyond 2090.

Decision makers and the public need to be aware of the accumulated long-term costs associated with decisions which leave waste in place, and are contingent on monitoring of institutional controls such as barriers, fences and pump and treat systems, and if necessary cleaning up more waste if the institutional controls fail or cleanup levels change. Choosing an end date of 2090 does not take into consideration the long-term monitoring of contaminants such as Plutonium-239, which has a half-life of 24,000 years and will remain in the environment for 240,000 years. Additionally, the Department of Energy has said at recent public meetings on PW-1,3,6 and CW-5 that it will have a monitoring presence at Hanford “for as long as the hazards exist” because of the long-lived isotopes that will remain in the ground. The report should include an estimate of the cost of monitoring such contaminated sites with institutional controls essentially forever. We believe the Report would provide a more compelling argument to accelerate a thorough and protective cleanup in the near future while avoiding increased long-term costs later, if the end date and total cost in the Report reflected this mind-boggling timeframe.

We would also like future Hanford Lifecycle, Scope, Schedule and Cost Reports to include a clear picture of the cost and schedule impacts of delays and decreased funding as well as the impacts of accelerating or delaying individual cleanup projects.

We urge DOE to revise cost estimates and projections in the Report to include:

- A transparently arrived-at cost basis and complete range of costs.

- Characterization costs for waste sites such as the 43 miles of unlined trenches used for disposal, and/or partial retrieval of high-threat wastes.
- Temporary and longer-term storage costs and additional cost for capacity for storage of processed Hanford high-level waste to show a cost range in the event a deep-geologic repository is not sited and ready to accept waste by April 2023 (which we find highly unrealistic.)
- Anticipated costs that appear to be missing such as:
 - Impacts on underground storage tanks and tank waste if treatment is delayed, such as leaking tanks or a collapsed dome.
 - Impacts to the vitrification process and waste removal from the tanks if there are significant problems due to delay and potential technical malfunctions at the Waste Treatment Plant.
 - Continued “safe and compliant costs” until all facilities or structures are gone.
 - Additional worker training costs, if workers are laid off or moved to other projects and then brought back.
 - CERCLA five-year reviews reveal that remedies were not protective and additional cleanup work is necessary.
 - Final ROD’s do not confirm that cleanup levels established under interim ROD’s are protective of human health and the environment and additional cleanup work is necessary.
 - Long-term stewardship costs.
 - New discoveries of unanticipated contamination, such as the recent contamination below the 324 Building’s B-Cell, requiring remediation.
 - Complete removal of Hanford’s underground storage tanks and vadose zone contamination resulting from tank leaks.

We appreciate the opportunity to share our input and look forward to future versions of the Report.

6. Hanford Advisory Board, Susan Leckband, Chair

The Hanford Advisory Board (Board) has previously provided advice on how the Tri-Party agencies should meet the stated goals for the Lifecycle Scope, Schedule and Cost Report (Report), including specifics for content, in Board Advice 223. The Board acknowledges the effort that went into crafting this important report which we have eagerly awaited. Although the initial Report does not meet some of the key goals it was expected to, such as how alternate additional cleanup actions may be scheduled and accelerated, it is a welcomed starting point.

The U.S. Department of Energy (DOE) has recently released the first edition of this annual Report with a great deal of attention by the media, concerned public, and Congress on the total estimated cost of \$115 billion for the remaining cleanup work at Hanford through 2090; long term stewardship costs may extend beyond 2090. It should be noted that the bulk of the active

cleanup is expected to occur in the next 50 years. The cost estimates may change from year to year.

The Board urges the public to use caution when using the summary cost estimate presented because it does not include: 1) important Hanford cleanup work elements which the Board expects may be necessary, and 2) fully developed cost estimates for known or unknown future work. The Report includes a table of pending decisions that may have cost impacts. The summary and body of the report are based on assumptions that no further work will be required by such upcoming decisions as:

- Cleanup of contaminated soil sites along the Columbia River beyond levels already achieved under the interim Records of Decision ROD;
- Characterization of key portions of the wastes in 43 miles of unlined trenches used for waste disposal, and/or partial retrieval of high threat wastes;
- Closure of high level nuclear waste tanks may involve remediation of soils or removal of some tanks.

Consistent with the Tri Party Agreement (TPA) requirements to present the upper bound cost estimate for reasonable alternatives, the Report should present the reasonably foreseeable range of costs for *all* work which may be required by pending decisions (see footnote for relevant TPA requirement¹).

Rather than presenting cost ranges based on the TPA legal requirements, the Report frequently utilizes the minimal cost alternatives. It does not take into account time required to meet Resource Conservation Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requirements for characterization of the quantities and locations of wastes in soil if wastes are to be left behind, nor is the base cost based upon legal compliance and “the upper bound” of retrieval costs. The Report is based on an assumption of extensive use of institutional controls continuing for generations. The Board questions this assumption and finds it inconsistent with Board values (e.g., values for Central Plateau cleanup, or restrictions on Treaty rights to live along and fish along the River).

Advice

For future revisions of the Report, the Board advises DOE to consider the following recommendations:

- The Board advises the executive summary include an overall total cost estimate of the reasonably anticipated costs of work which are missing from the current estimate. Examples of such anticipated costs would include: characterization and retrieval of wastes and cleanup along the Columbia River; further characterization or remediation of numerous landfills and burial grounds not covered by interim ROD and, soil characterization, and retrieval / remediation associated with closure of high level nuclear waste tanks.

- The Board advises the Report provide sufficient information to fully understand the impacts of delaying or accelerating individual cleanup projects. An estimated project dollar cost does not provide a full understanding of what additional costs may be incurred if a project is delayed, or what costs could be reduced if the project is accelerated. Additional costs could include ongoing “safe and compliant” costs; worker retraining costs; costs to upgrade or replace infrastructure; costs to maintain adequate and available disposal facilities; and other relevant costs. In addition, the report should estimate the cost of responding to a leaking double-shell tank or a collapsed tank dome – since those are potential impacts of further delays in cleanup.
- The Board advises the Report show reasonably expected near term cleanup actions which may be required with schedule and cost for the River Corridor (such as further soil site remediation after 2014), which impacts funding capacity and assumptions for Central Plateau work.
- The Board advises the Report include in the body and executive summary of the Report all the work and costs presented in the examination of the Solid Waste Burial Grounds (SW-2). The Board has repeatedly urged retrieval as a reasonable part of the remedy for the burial grounds (including [Central Plateau with flowchart 197], Board Advice 226, 243). DOE should revise the analysis to reflect reasonable alternatives and should not include \$5 billion in unsupported contingencies for retrieval on top of a standard contingency already in the cost estimate. The report should show the low end costs including reasonable characterization costs (full range is shown in the Remedial Investigation/Feasibility Study).
 - The Board advises the Report should not be based on proposals to leave all wastes in ground as a “reasonable alternative” (including SW-2 burial grounds). DOE describes as a “reasonable alternative” limiting cleanup based on reliance upon institutional controls for more than 50 years.
 - The Board advises the Report should be replaced with projected work scope which retrieves and treats wastes to the extent practicable. This scope should assume either full characterization of units to support decisions to leave some wastes, or a range of retrieval alternatives. Timelines and costs should be revised to include CERCLA and RCRA characterization activities for any proposal that leaves waste in soil, in burial grounds, leaks, discharge sites, etc.
- The Board advises the Report add the Natural Resource Damage Assessment (NRDA) and any additional land lease arrangement to the list of facilities and other potential liabilities which are not included in the scope of the report, as identified on Page 8-1.
- The Board advises the Report present an alternative cost for temporary storage of high-level vitrified waste. Future reports should assume on site storage for an extended period of time.

- The Board advises the Report provide a summary to help the public understand tank waste system plan issues.
- The Board advises the Report provide clarification of infrastructure needed for remediation, such as U Canyon disposal project access.
- The Board advises the Report should include an appendix which lists “safe and compliant” costs for most major facilities and areas at the Hanford Site, including individual tank farms. This information would not only help in determining potential costs of delay or acceleration, but would also provide useful information to help prioritize cleanup activities.
- The Board advises the Report revise cost estimates and projections to include:
 - Range of costs
 - Anticipated costs that are missing (such as River Corridor)
 - Realistic costs for characterization
 - Temporary storage cost, and capacity required for temporary storage of processed DOE high level waste.
- The Board advises the Report include options for an accelerated schedule.
- The Board advises the Report to summarize documents referenced in the Report and provide links to those documents.
- The Board advises the Report provide a short separate summary with the range of costs and work schedules.

ⁱ The relevant TPA requirement for the Report reads as follows:

“In circumstances where final cleanup decisions have not yet been made, the report shall be based upon the reasonable upper bound of the range of plausible alternatives or may set forth a range of alternative costs including such a reasonable upper bound. In making assumptions for the purpose of preparing the initial report, USDOE shall take into account the views of EPA and Ecology and shall also take into account the values expressed by the affected Tribal Governments and Hanford stakeholders regarding work scope, priorities and schedule. The report shall include the scope, schedule and cost for each such PBS level two element and shall set forth the bases and assumptions for each cleanup activity.”

TPA Milestone M-036-01A