

FINAL MEETING SUMMARY

**HANFORD ADVISORY BOARD
TANK WASTE COMMITTEE MEETING
February 6, 2008
Pasco, WA**

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This is only a summary of issues and actions in this meeting. It may not represent the fullness of ideas discussed or opinions given, and should not be used as a substitute for actual public involvement or public comment on any particular topic unless specifically identified as such.

Welcome and Introductions

Ken Gasper, Tank Waste Committee (TWC) Chair, welcomed everyone and introductions were made. The committee adopted the October 2007 meeting summary.

Demonstration Bulk Vitrification System (DBVS)

Ben Harp, Federal Project Director Department of Energy – Office of River Protection (DOE-ORP), provided an update on the DBVS. He said his previous presentation to the committee included qualitative results, current issues, and a path forward for resolving issues. Ben’s presentation at this meeting focused on the Critical Decision 2 (CD2) status, latest results from the integrated dryer/melt test, and an introduction of the Interim Pretreatment System (IPS).

The near term scope for CD2 includes completing the design by incorporating recommendations from the Expert Review Panel, completing the Preliminary Documented Safety Analysis, developing procurement packages for Fiscal Year (FY) 2009, and then initiating construction. Ben reviewed a chart outlining the results of the dryer/melt tests that showed improvements in the leachable material present in the final product. Ben said they are still seeing rhenium (Re) and chromium in the final product and outlined some potential paths forward to address this issue.

Ben described how the IPS system would provide acceptable low activity waste feed for the early operations of the Waste Treatment Plant (WTP) and/or the operation of the supplemental low activity waste (LAW) immobilization technology. Ben said ORP's scope for the next year is to prepare the documentation to be able to award an architect/engineering contract in FY09. Ben said the President's budget that was recently released did not include the requested amount of funding for the DBVS project; ORP requested approximately \$45 million and they only received \$1 million.

Regulator Perspectives

- Suzanne Dahl, Washington State Department of Ecology (Ecology), said Ecology believes that a second treatment facility is needed, and while their preferred option is a second LAW facility, they agreed to continue to look at bulk vitrification as an approach as long as it can be as good as second LAW. She thought the report was well done and the tests were also good. The tests were not entirely prototypical but included many of systems that the prototypic model would. She said DOE-ORP is figuring out methods for reducing the material in the refractory and resolving the challenges in how feed is delivered prior to hot application. Suzanne said the sulfate layer at 3% is a level that would give Ecology concerns in a risk assessment (RA). She said LAW glass has no waste and bulk vitrification needs to get to zero as well and that will require more cold testing to make sure systems works. She said the molten ionic salt issue needs to be resolved as well.

Committee Discussion

- *How does the budget shortfall affect the project?* Ben said the shortfall will delay the project and when the money is available they will need to reevaluate cost escalation.
- *Recently there has been some talk about doing a smaller bulk vitrification system that could include one or two lines; can you tell us more about this?* Ben confirmed that it is being considered but has not been decided on yet. He said they are looking at the system as a whole and are considering looking at locating bulk vitrification in the east area and plan to do some envelope testing.
- *How can the test be successful if there is still material that is leachable?* Ben said the success is based on criteria that the technology could continue going forward and meet goals in the future. He said they are driving for the uranium to be zero, but comparing results from the last test to this one, it is much lower. The technology has made progress, and the team thinks they can keep making progress. This is a technology and development project and the team needs to continue to look at issues.
- *What material is on the lid?* Ben said it is the feed material and they accounted for the material as part of the mass and considered it leachable.
- Al Boldt said Ben's charts identify three percent Re that is not in the glass, but that means there is seventeen percent unaccounted for. Al thought the missing seventeen percent should not be attributed to the glass.

- *Who has done the calculation to say how much leachable material can be released from the container and still be safe?* Ben said they cannot do that until the Tank Closure and Waste Management Environmental Impact Statement (TC&WM EIS) comes out.
- *Can you do smaller scale melts?* Ben said they are looking at a 1:6 scale test.
- Al said the sulfate to sodium ratio inventory varies in tank farms by tank; the high sulfate which is typical feed is four times what the testing has been to date. The amount of sulfate that is insoluble could go up by a factor of fifteen with the higher sulfate tanks. The result is a big inventory of sulfate extracting more Re and it will have to cook longer to get rid of the salt. The amount of sulfate in the feed will drive the technetium and Re performance. The tests to date use a best case scenario and are based on one tank; they do not evaluate the performance for the true feed. Al said more small scale cold testing is needed at levels that represent all the waste. Ben said their 22 series testing program includes lab scale and enveloping the waste feed. ORP looked at accelerating those as a risk mitigation action in the early years.
- Al said he also had concerns about the feasibility of the plan to continue full scale tests in the next year. He felt there should be more small scale tests done before going ahead with the high cost elements of scaling up.

Tank Waste System Plan

Ken prefaced this agenda item by saying there was an issues managers meeting held last week to discuss Rev. 3 of the Tank Waste System Plan. The plan attempts to tie together the whole tank farm system and provide material balances. There is a presentation regarding this information available to interested committee members.

Harold Heacock said there are positive things in the study and there are also shortcomings. The current baseline assumptions do not look at alternative treatment systems such as a second LAW plant or changes to the melters. Ken clarified that DOE has said they would not consider all the alternatives; this study is their baseline study of a certain point in time, and not an alternatives study. Harold outlined what he viewed as the limitations of the study. He said the study does not reflect speed-up over site schedule and does not increase single shell tank (SST) retrieval rates necessary to meet the agreed upon end date. It also does not address the replacement of the evaporators which Harold felt would not last another twenty years. Harold said the plan included an analysis of the chemistry of the feed rates but was missing alternatives for low level waste. He said the plan was based in part on a high sodium input from the separation of aluminum. Harold said the information on the feed composition is a good start and is something the committee has been asking for.

Harold said he is concerned because the plants and infrastructure is already 50-60 years old, and he felt the baseline needs to include replacement of the infrastructure. He recognized that this was not the purpose of this study but thought it was an important piece of the whole picture. He also thought alternatives such as a second vitrification

plant and another melter should have been included as well. Harold said he thinks the committee should make an effort to encourage the type of work that went into this study because the report is a good start.

Delmar Noyes, DOE-ORP, said they are working to put this into a concise document. The purpose is to communicate the current baseline. The last time they did this was in 2003 and Delmar said they needed a new data set to represent ORP baselines. Delmar said the tank farm baseline was estimated at 2016 for the start date and had to be adjusted to reflect new baselines. Delmar said he recognizes there are challenges and wanted to highlight them to show they are working on the issues and would like to show how they think the issues could be dealt with in best case and worst case scenarios in order to facilitate discussion. He said they expect the final document to be out by the end of March. Harold said the document represents a tremendous amount of work and he appreciated it being done.

Regulator Perspectives

- Suzanne said the mass balance chemistry matched the flow sheet from WTP. The report included a lot more detail on secondary waste which Ecology appreciated. The waste was divided up into the disposal sites. Suzanne said the timeline and completion dates are not acceptable. Some of the changes ORP made for retrieval will make the treatment process slower because they will have less ability to blend waste and at some point the lower level treatment systems will starve. Suzanne felt that the report shows where the issues are going to lie and provides a sense for how these issues can be resolved.

Committee Discussion

- Al said this is the first time he has seen a good analysis of feed streams and DOE seems to be recognizing they have an issue. However, Al thought the current plan is retrieval limited and the negotiations seem to be based on the Tri-Party Agreement (TPA) date of 2041.
- Steve Wiegman, DOE-ORP, said the System Plan has not been published yet and asked committee members to wait to form their position on the plan until the final document is released. He encouraged committee members to continue to get more information from ORP if they have more questions.
- *What is the relationship between this plan and the baseline?* Delmar said the system plan communicates ORP's existing baseline. The business case has a different purpose and does not attempt to communicate baselines at all. The business case looks at treatment pathways and will determine where money should be invested today to get to the endpoint faster.
- *Have you shared the information from the system plan with headquarters (HQ)?* Delmar said they have communicated ORP's baseline with HQ but there are hundreds of data points behind the baselines and communicating the technical complexity of the baseline is a huge challenge.

- Steve said there is a discussion planned with the Budgets and Contracts Committee (BCC) to discuss how to talk about ORP and Richland Operations Office (RL) baselines. Steve said it has been some time since DOE has discussed baselines and they are re-learning how to do that. DOE wants to make sure they communicate it in a way that is useful.

Fractional Crystallization Committee Discussion

Al said the issue managers for fractional crystallization received a presentation from the agencies on November 8th, 2007. Al explained that fractional crystallization is a technology DOE and their contractor have developed to generate a pure sodium nitrate/sodium sulfate salt that is almost completely decontaminated to support the bulk vitrification process. Al discussed the implications of the startup dates for bulk vitrification and LAW. Al said he and Dick Smith felt that if this technology is ready for an engineering assessment it looks like a good process. Fractional crystallization is not without its impacts on downstream operations. Al said the LAW feed is de-blended and the enriched stream still goes through pretreatment. Al thought the evaluation Ben Harp proposed should look at the differences between the impacts to the system. LAW will produce more glass with this blended feed. Using fractional crystallization for bulk vitrification could cause a problem with having more sodium sulfate. Al said he is happy to see DOE studying this technology but said it needs to include impacts to the rest of the plant.

Ken explained the connectedness of this topic to prior Hanford Advisory Board (HAB or Board) Advice #192. Ken said the issue managers are asking for a system analysis on supplemental pretreatment, not just the technology but the applications as well. Ken said the issue managers would like to see these studies be done before some of the high expenditures are made.

Steve said ORP is trying to make up losses on the vitrification plant delay. One challenge with doing a systems analysis before test information is available is the analysis will not be based on reality. Steve said it is a balance, the fact the issues manager team is focused on systems thinking helps the dialogue to recognize the challenging position. Steve reminded the committee that when DOE-ORP does research work they have to apply for separate money to do that.

Regulator Perspectives

- Suzanne said Ecology is following all of these issues and is trying to figure out how to accelerate dates or optimize processes to speed up the work.

Business Case Evaluation Report Committee Discussion

Dick Smith provided context for this discussion. He said in November-December of last year there was a draft report issued in response to a request by the Government Accountability Office (GAO) about whether the bulk vitrification plant is needed. Dick thought it was inappropriate to use this document in decision making when it had not included a comment period. The purpose of the report was to show why supplemental treatment was necessary. Dick felt that DOE demonstrated the need for supplemental treatment in this report by slowing down the production rates by thirty-three percent from the initial value. Dick and Al put together a white paper to evaluate the scenarios the DOE report considered and to argue why other scenarios should have been looked at as well. Dick said the report did not consider the option of adding a third melter in LAW which would have increased production by fifty percent from the initial value. The scenarios the report included supported the need for supplemental treatment which Dick and Al felt meant bulk vitrification. Dick said he also had concerns about the cost analysis because it appeared to favor bulk vitrification. Dick and Al thought there should be some additional analysis done to look at other supplemental treatment alternatives.

Dick explained the second part of this discussion is to consider advice he and Al drafted regarding these issues. Dick reviewed a figure he put together to demonstrate years to complete operations without bulk vitrification based on throughput. His chart shows it would take sixty years to get the job done. Dick showed that if you add a third melter the production rate increases and could get the work done in forty years. Dick thought this demonstrated a contradiction in their report for the need for bulk vitrification and thought the committee should ask that other scenarios be evaluated as well.

Regulator Perspectives

- Suzanne explained one issue involved with adding a third melter is the effect it would have on the mechanical handling; there is not enough capacity to remove all the cans with three melters operating at once. Suzanne said she attended one of the preliminary system plan review meetings and a discussion on WTP throughput ensued. The previous system plan included throughput levels that DOE was not prepared to commit to during negotiations. Ecology had asked why the option of having two melters operating at a chain rate was not included in the baseline. DOE wanted the baseline to be what they knew they could do and not based on a future plan to try to have a higher capacity. There was a rational and reasons behind the information in the systems plan and Ecology understood the premise. Steve added that every analysis DOE-ORP has ever done said supplemental treatment is needed, the percentages may have changed, but they need more LAW capacity.

Committee Discussion

- *Have handling studies been done to show the limitations of the mechanical handling of the canisters?* Dennis Hamilton, CH2M Hill Hanford Group (CHG), said there are elaborate models on the mean time to repair failures and to handle the canisters. Al suggested this problem might be resolved by a minor change to the design of the

canister, and this evaluation should be done before continuing with the bulk vitrification work.

- Al thought the advice from the Board should focus on recommending that DOE maintain a single set of assumptions in their documentations. Dick added that if DOE changes their assumptions they should say so and explain why. Steve said when he reviewed the white paper with his technical staff he was not aware of the concern regarding assumptions so he did not address this issue with them. He suggested the agencies and issues managers have further discussions about the assumptions used in this document before it elevates to advice or a topic for the full HAB. The discussion is getting caught up in the issues of the effectiveness without vetting how the assumptions were made. Steve agreed that there should be a description of why the baselines change when they do so these issues do not continue.
- Pam Larsen said when the HAB toured the LAW facility DOE explained they could not add a third melter because of the amount of heat that the melters produce. Dick agreed that it is a matter of the time it takes to cool the canisters down. He said DOE currently is using heat absorbers to cool the canisters but could also include a canister cooling operation and increase the throughput rate. Pam said that is a question issue managers should explore with DOE technical staff before advocating for a third melter.
- Al reminded the committee that he and Dick previously produced a white paper that addressed the cooling operation. He said right now if the melter fails, DOE only has one. If they had three that ran at a third of the total rate, then if one failed they would still have two with the same throughput. Al felt there are other ways to remove additional heat.
- Bob Parks suggested looking at the issue from a monetary perspective, adding more melters is similar to having three car payments even though you only have two cars. Al argued that you could get significant improvements in throughput using a third melter, you would not need bulk vitrification, and could get it done in the same timeframe. Al said the Board cannot issue advice about what DOE should study as an alternative because it is too technical. The advice is focused on DOE's tendency to write reports that manipulate the numbers to support their missions without considering other alternatives fully.
- Maynard suggested having a discussion with DOE prior to the committee moving forward with the advice to be sure both sides understand the concerns. This is not time critical and the committee should work collaboratively with DOE moving forward. Harold suggested holding an issue manager meeting to go through these topics in more detail to see if a common ground can be found. Maynard agreed and said it is important to have DOE and their contractors involved in that meeting.
- Steve said the business case study was not a report DOE-ORP could communicate about prior to releasing it and he said they are seeing the consequences of that.
- Jerri Main said there are two separate pieces of advice being proposed, they are both good, but the accusations should be omitted before it proceeds.

FY10 Budget Input

Pam thought the IPS concept introduced this morning is compelling. Pam said she understands it is essential to WTP but is not embraced in the funding process for the next year. Steve said DOE-ORP should talk with the committee about how IPS fits into the flow-sheet. He said ideally the pretreatment facility would be the first facility finished. If LAW treatment is started ahead of the LAW plant, pretreatment will be needed. Steve said these issues will be brought up when DOE discusses the budget with the Board during committee meetings next week

Al said a handout he received summarizing FY09 funding shows that supplemental treatment is not funded in FY09. Steve read the handout Al was referencing and said it was meant to emphasize that the priorities in the program start with minimum safe and essential services which uses most of the budget if the budget is under \$230 million.

Ken said the committee is sensitive about budget plans going forward that establish a particular work scope to be funded when other documents make assumptions about the scope of work that is considerably different. That is where bulk vitrification has caused a lot of consternation within HAB because the technical assumptions for the project have it running at a certain date when the project is not funded. The HAB needs to know what the funding assumptions are for FY08 and FY09 so Board members can advocate for funding in FY10.

Steve said one challenge DOE faces for the FY10 budget is how to prepare a baseline to complete a project in a timeframe with a budget constrained environment. DOE is in a hard place because it makes the baselines look inconsistent to the FY budgets. DOE needs to be effective with the money from the FY09 allocation because the Department is not going to get any additional money.

Pam asked if the documents from ORP's FY09 budget request identify the target and over target amounts. Steve said they discussed this information with the HAB during last year's budget workshop. Pam said she intends to aggressively pursue additional funding from Congress. However, she needs the information for what projects are over and which are under so she will know what to ask for in FY10. Steve said Shirley Olinger gave this list to the HAB.

Pam said there have been many years that the President's budget was upsetting. The Board needs to figure out how to work through this and how to craft advice to DOE but also to a wider audience to educate about the funding issue.

Steve said DOE would appreciate input on how to communicate the priorities for what DOE says they can do with the resources they currently have. Steve said they will discuss FY08 and FY09 budgets during the BCC meeting next week. Maynard said the HAB is hoping to hear this information from the RL side too.

U.S. Nuclear Regulatory Commission (NRC)

Bob Pierson, NRC explained that the NRC is an independent regulatory agency; with direct report to Congress. Bob said this position gives the NRC latitude between the agencies they regulate and the public. He said the NRC licenses and regulates civilian use of radioactive material including the use of isotopes in the medical industry, production of fuel at power plants, etc.

Bob noted that recently Congress tasked the NRC to conduct a review of the regulatory processes of the WTP. Bob said they have a short time frame to determine the review process and would like to get HAB input on the process. NRC's timeframe is to conduct the analysis in March and April to make the timeframe for the report submittal in June. Bob said the report would include legislative impacts requiring Congress's approval. NRC has regulatory authority of special nuclear materials that would be applied to Hanford. NRC's first step will be to evaluate DOE operations that exist today focusing on safety and environmental programs of these facilities. Bob emphasized that it is not NRC's objective to have Congress give them oversight of DOE facilities.

A public meeting on the review efforts will be held on February 13th at the Red Lion Hanford House in Richland. NRC has met with DOE-HQ and with local DOE offices. They will be presenting to the full Board this week and are hoping Board members will convey this information to other stakeholders.

Cathy asked if committee members would like a follow up report from NRC in March. Everyone generally agreed this would be useful.

Action Items / Commitments

- Revised draft advice from Dick and Al will be circulated to the committee for review. There will be an issue manager meeting prior to the March committee meeting with the agencies to review this advice.
- Ken suggested having ORP come back to the committee in March to present their path forward for DBVS and account for the issues raised at the issues manager meeting including the budget information. Steve said ORP may need more time to review the budget information and they may not be prepared to report by March. Al clarified that he would like to hear how the extra allocation for the DBVS from 2008 is being used.
- Harold said the committee will need to review the issues in the Systems Plan and identify the studies are happening in relation to the plan. Ken said this topic needs some issue manager work before it proceeds to the Board. Steve suggested ORP should provide the same briefing for the full committee that they did for the issue managers. Steve agreed to work with issue managers to prepare the presentation for the committee.

- Fractured crystallization – Al said he got most of what he wanted on this topic from the issue manager’s meeting. Al said he would work out his remaining concerns with ORP independently and thought the issue had transferred into the IPS topic.
- Business case study – Ken suggested the draft advice go through another iteration with the issue managers and ORP before it comes back to the committee.
- NRC – March update.
- The committee will need a Tank Closure & Waste Management EIS update within next three months.
- Jeff Lyon, Ecology would like to talk about what tank closure would look like, when the agenda permits it.

Handouts

NOTE: Copies of meeting handouts can be obtained through the Hanford Advisory Board Administrator at (509) 942-1906, or tholm@enviroissues.com

- Demonstration Bulk Vitrification System, DOE-ORP, February 6, 2008.
- Engineering Evaluation of Supplemental Pretreatment Technology Scenarios for Early Start of the LAW Treatment Facility, Dick Smith and Al Boldt, January 30, 2008.
- Comments on DOE/ORP-2007-03, Rev. 0 Draft; Hanford River Protection Project Low Activity Waste Treatment: A Business Case Evaluation, Al Boldt and Dick Smith, January 15, 2008.
- Draft Advice: DOE/ORP has not exercised control over system baseline assumptions in critical studies that inform decision-makers, Al Boldt and Dick Smith, February 2008.
- U.S. NRC Role in the Review of the DOE Regulatory Process for the Hanford Waste Treatment Plant, Bob Pierson, February 6, 2008.

Attendees

HAB Members and Alternates

Al Boldt	Steve Hudson	Maynard Plahuta
Greg deBruler	Pam Larsen	Wade Riggsbee
Dirk Dunning (phone)	Susan Leckband	Dick Smith
Ken Gasper	Jerri Main	John Stanfill
Norma Jean Germond	Ken Niles	Bob Suyama
Harold Heacock	Bob Parks	

Others

Ben Harp, DOE-ORP	Robbie Biyani, Ecology	Dennis Hamilton, CHG
Billie Mauss, DOE-ORP	Madeleine Brown, Ecology	Cathy McCague, EnviroIssues
Lewis Miller, DOE-ORP	Suzanne Dahl, Ecology	Emily Neff, EnviroIssues
Steve Wiegman, DOE-ORP		Suzanne Heaston, BNI