

FINAL MEETING SUMMARY
HANFORD ADVISORY BOARD
TANK WASTE COMMITTEE MEETING
September 13, 2011
Richland, 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

Dirk Dunning, Oregon Department of Energy and Tank Waste Committee (TWC) chair welcomed everyone to the meeting and led a round of introductions. Dirk reviewed the purpose of the meeting.

Dirk said he will provide a few changes to the August meeting summary before its adoption.

Cathy McCague, EnviroIssues, introduced Jessica Ruehrwein, EnviroIssues, who will be filling in as facilitator for the TWC while Cathy is away on maternity leave. Jessica comes to EnviroIssues with a natural resource management background and is well versed in working with stakeholders and complex issues. Melissa Thom, EnviroIssues and Hanford Advisory Board (HAB or Board) note taker, will be taking notes for the committee meetings while Nicole Addington, EnviroIssues, is away for maternity leave.

Appendix I of the Tri-Party Agreement (TPA)

Agency overview

Chris Kemp from the Department of Energy (DOE) Office of River Protection (DOE-ORP), noted that DOE will be making a decision on when to hold the next performance assessment (PA) working session based on funding issues and will update the TWC as soon as possible. He said that TPA, Action Plan, Appendix I is the document that drives how DOE and the Washington State Department of Ecology (Ecology) will retrieve waste and close the tanks. Chris said the consent decree covers the milestones associated with retrieval.

Appendix I documents how DOE will close the single-shell tank (SST) system, which includes the tanks themselves, piping, bowel pits, and conversion boxes. Chris said there are seven tanks to close in C Farm, and there is 6.3 miles of contaminated pipeline to go with those tanks. Appendix I also addresses how to close the waste management areas (WMAs). Chris said that for the Ecology, the SST system includes components that go beyond the WMA, which is covered in the IS1 Operable Unit (OU) decision, and are identified in the SST closure permit and the current Part B permit. Chris said the SST system has been declared as unfit for use and that no new materials may be brought on site for storage.

The Figure I-1 depicted within Appendix I as the retrieval and closure process was as agreed to by the TPA agencies and as outlined in Appendix I, which was adopted in 2002 or 2003. Chris reviewed a diagram of the waste retrieval process, noting that it is how, in a graphical sense, the systems engineering process that would retrieve and close tanks. Chris said there are 13 SST farms that are broken into 7 WMAs. C Farm is one of four tank farms that were built during World War II; it features seven diversion boxes and five large catch tanks. Chris said the description of C Farm is very similar to three other tank farms. Other WMAs include the B complex, A/AX complex, T complex, TX/TY complex, U complex, and S/SX complex. The Appendix I considers for soil media corrective actions. Both WMA C via the Resource Conservation and Recovery Act of 1976 (RCRA) closure permit and the groundwater under C Farm along with the northern side of the 200-East Area is lead regulated by Ecology.

Chris said tanks must be closed under the RCRA and DOE Order 435.1. Chris said a PA must be conducted for each WMA per the TPA Appendix I which requires a single performance assessment to address both a radiological risk assessment and a hazardous assessment. He said there will be a RCRA closure plan for the SST system, WMA, and tank components.

RCRA closure plan:

- Tier 1: System-wide
- Tier 2: WMA
- Tier 3: Component.

DOE Order 435.1 closure plan:

- Tier 1: WMA
- Tier 2: Component.

Chris noted the difficulty of keeping the terminology between the regulation and the Order correct is often difficult to communicate. Chris said closure plans have been drafted. Also Washington DOE has a draft SST closure permit and the closure plans will need to be compliant with the final permit conditions.

Chris spoke to the work currently being done, noting that C Farm is currently 20 times above the drinking standard for Technetium-99. He said there have been 72 pushes to find the source of contamination, but no one has found the large source in the vadose zone that is contributing to the increase of Technetium-99 in the groundwater. Some are presuming that the source has been washed out because of water lines that used to run through C Farm. He said they will need to complete a corrective measure study to meet all needs, in addition to a soil study for RCRA and then a DOE Order 435.1 component study of radionuclides in the soil.

Chris said that Section 2.5 of Appendix I addresses tank sequencing and PAs. He said that only one PA will be completed for each of the seven WMAs. Chris noted this is a good thing as different people, who may be conducting the same assessments using the same models, may end up at different results due to conceptualization. From a technical standpoint, one PA is sufficient. He said PAs are larger than risk assessments required for sole contaminants and will thus meet all requirements.

Regulator perspective

Dan McDonald, Ecology, recognized the complex system of Appendix I, and he noted that it is because it is important to retrieve waste in the correct order. Dan said Ecology hopes to work closely with DOE in order to understand how tank retrieval and closure will play out in the life cycle of Hanford. He said the Waste Treatment Plant (WTP), for which he is the project manager, has a huge interest in making sure wastes come to WTP in an appropriate way.

Committee discussion

- Dirk said Appendix I covers all tank farms, and C Farm is the first farm the agencies will clean up and close. He said C Farm will be the test to see if Appendix I actually works. Dirk spoke to the already large disconnect of previous monitoring efforts of soils and groundwater under C Farm, due to the level of Technetium-99 being 20 times the drinking standards, whereas previous efforts indicated a lower level at the contaminant's peak. Dirk said this issue raises questions about where the contaminant is headed given that levels are still rising. He asked which part of the process will address the uncertainties. Chris said uncertainties are not addressed directly but are incurred indirectly through the PA section. He said what appears as uncertainty now has a very firm process at a higher level, both under retrieval and risk assessments. Chris said nothing is perfect with the modeling type being used. Chris noted that Technetium-99 is mobile, and it could have washed out of the soil from losing raw water from the pipes, or it might have been a lateral flow from another source. Chris said the work has been designed to try to address some of the issues. Dirk said the focus of it will be in a remedial investigation/feasibility study (RI/FS) under the Comprehensive Environmental

Response, Compensation, and Liability Act of 1980 (CERCLA), and a corrective study under RCRA. Chris confirmed the use of the RI/FS and clarified that the corrective study will be a RCRA Facility Investigation/Corrective Measures Study (RFI/CMS). Dirk noted that those processes are essentially the same, but reversed at one point. He said the processes place emphasis on the models, applying them, and then moving the models parameters, which creates the uncertainty. He said uncertainty has been defined as the sensitivity of the model. The processes may lead to errors, and in conceptualization errors, models may not demonstrate anything about actual behavior. Dirk said the errors need to be corrected in an RI/FS. He said uncertainty is hard because it applies at several conceptual levels.

- Dan asked if one of the expectations for the RI/FS and RFI/CMS processes is to confirm assumptions and narrow the range of uncertainty. Dirk said that if he understands it correctly, the answer is yes. But there is field data that is not backing up previous assumptions. He asked if there is feedback loop is in the process to go back and solve the problem. Dan suggested refuting the initial data and looking at the new data to assert if the initial conceptualization is different. Dirk said the preceding idea under the Toxic Waste and Superfund laws is that there should be an engineering approach to try to understand what is going on with geology. He noted that the newer processes are more discrete methods that are called out in the procedures and needs of Appendix I.
- Vince Panesko, City of Richland, said he supports DOE presenting on Appendix I today because it is referred to often, and in previous attempts to read it, he expected to see milestones outlined. Vince said the presentation is helping him to understand that Appendix I is the closure process. Chris confirmed it is the retrieval and closure process, and that it currently represents two milestones, one from the Consent Decree and one from the TPA. Both milestones say close C Farm by June 30, 2019. Vince noted that Appendix I standardized the approach for closing all tank farms.
- Vince asked if anyone considers Appendix I to be outdated. He asked if it is possible that it does not align with what is actually going on today. Chris said he does not know of anyone looking to rewrite it. Vince said if the committee feels it should be updated to be more user-friendly, and that it may be a topic for policy level advice.
- Vince noted that C Farm is the focus now, but that DOE is talking about standardization across farms. He asked if there are any activities happening on the other farms. Chris said Milestone 045-84 (M-045-84) requires DOE to consult with Ecology on which WMA to work on next. Part of that milestone requires that nine tanks in the next WMA be retrieved by 2022, having started retrieving seven tanks by 2017. Chris said DOE and Ecology just finished the consultation in August, and have determined that the next WMA for retrieval and closure will be A and AX farms. Ginger Wireman, Ecology, noted that A and AX are currently undergoing preliminary soil work to prepare to be the

next set of tanks. This work was done simultaneously in consultation between Ecology and DOE.

- Vince asked if the committee will be allowed to respond to the draft SST closure permit that Ecology will provide to DOE in November. Ginger said the document will go out for public comment after Ecology receives DOE's comments. She noted that DOE and Ecology negotiations will take two months, so the committee might not see the document until January. Chris said the public comment period might be as long as 180 days.
- Liz Mattson, Hanford Challenge, said there are too many moving pieces under Appendix I. She said it would make sense to update charts and diagrams as more information comes forward to influence the process. Liz said it is disconcerting to know that there are other documents that influence tank closure, like the Tank Closure and Waste Management Environmental Impact Statement (TC&WM EIS) and RCRA permit, without understanding how the documents and processes align.
- Vince asked if any WMA integration studies have been submitted for C Farm. Chris said yes, under the C Farm work plan. He said he can provide the TWC with a copy.
- Dan asked that Chris take some time to name some of the related reports and how they fit together. Chris said that for retrievals, DOE completes a tank waste retrieval work plan to be submitted for Ecology's approval. Then retrieval starts, and the Consent Decree requires heel retrieval if above 360 cubic feet. If then, there are still contaminants above 360 cubic feet, DOE will implement a third retrieval process. After reaching 360 cubic feet, they will take samples of the residual using a standardized samples analysis used in all tanks. Chris said next is a retrieval data report, which is a summary of what is left in the tank. There is then a work plan for soil corrective work, which goes through much iteration. Chris said soil investigative studies have one phase and two work plans. Chris noted that this whole process has lots of feedback loops, which includes the TWC. Chris said work will continue in this manner for both the RI/FS and the RFI/CMS that are evaluating the contaminants in the soil of the vadose zone.
- Dick asked what is done with the nine samples from residue; he is concerned about the actual hazard the material left. Chris said it is contaminated, so there will be a retrieval data report summary that tells how much volume there is and the contamination level from a radiological and hazardous materials standpoint. Chris said the samples have been run through leach studies to see if the contaminants are mobile, and he can provide reports to support that what is left in the tanks is not very mobile. Dick asked if the 360 cubic feet figure is being used based on an assumption that the residue will be the same composition as what is in the tanks. Chris said some of the residues are more contaminated than what was in the tanks, but in some areas are less contaminated. He said they will have more feedback available when the PA is updated. David Bernard, Nez

Perce Tribe, said approximately 90 percent of the risk is from leakage, which gives a good idea of the risk involved.

- Liz asked if each tank gets sampled for residual analysis. Chris confirmed. She asked how the iterative PA process works if there will be seven PAs to continually update. Chris said PA Revision 0 will be updated for C Farm, and they will follow the same process for T Farm. He said all PAs will be updated when there are new sources of information, like how it was done along the River Corridor. Liz asked when the next PA will be complete. Chris said three to five years, and that they have the option to update all PAs after each tank farm is complete, but it might be a big, unnecessary effort.
- Dirk said that he has been involved with RCRA since the beginning, and he spoke to the disagreement of how clean is clean in the tanks. Initially, EPA allowed the TPA to state that a tank is clean when there is less than one percent of residual left in the tank, but that notion only lasted a few years because people were getting hurt from the residuals. Additionally, environmentally speaking, cleanup should be as much as possible; others believe cleanup should be to an end point (do what has to be done and nothing more). Dirk said this disagreement has not been resolved, and he thinks it warrants a discussion.
- Liz said she thinks it would be appropriate to start a tracking document related to Appendix I to help the committee follow the related documents and issues as tank closure progresses. She noted that the tracking document should be more specific than meeting summaries, as it would need to be more direct and accessible. She said the tracking document would be helpful because it is a long process and she is already starting to lose pieces of the earlier related discussions. Cathy said that information would be easily accessible on a SharePoint site. She suggested creating a spreadsheet to demonstrate what the committee has talked about and how it feeds into upcoming documents. DOE could keep the committee updated on which documents relate and what they should be looking at. Liz said it will be important to track these issues when it gets to be 2019 and most of the people currently working on it have moved on. She says future Board members will need to know the history, and a tracking document can record that. Dirk suggested that a HAB shared history for future involvement be addressed in the Public Involvement and Communications Committee (PIC). Dick said that when the first tank in C Farm was completed, DOE did not manage to reach 360 cubic feet so they decided to go through the Appendix H process. Dick said he examined the process and the justification for their actions was really poorly done. He said it did not stand up to any rational scrutiny, and he hopes it is done better in the future. Dick noted that Appendix H is the process for what DOE should do if they do not reach 360 cubic feet for retrieval; it determines what they have to do to get down to 360 cubic feet in terms of risk to workers and cost studies, etc. Dirk said Appendix H talks about the distinction between active tanks and tanks that are essentially empty. Dick said it determines if something more has to be done.

- Tom Carpenter, Hanford Challenge, said DOE Order 435.1 is not compliant with national law on waste policy per a U.S. District Court in Idaho. The issue was litigated by the Yakama Tribe and the Natural Resource Defense Council. He said the decision for now is to take the issue back to the court when there is something to act on regarding leaving one percent in the tanks. Tom said the decision means one percent of residual cannot be left in the tanks. Dirk said the agencies, to some degree, are looking to rewrite parts of DOE Order 435.1.
- The committee discussed how to proceed with Appendix I, whether it be with policy level advice or just continued tracking. Vince said it would be helpful to continue to study Appendix I and the associated diagrams to better understand where DOE is with work plans and other plans that apply to C Farm, in addition to what is happening in the upcoming tank farms. Cathy suggested that the committee wait to see what comes out in the Ecology SST report due in November. Dirk suggested asking an issue manager group to flesh out advice ideas with the agencies. Vince said the committee should consider advice in the short term, because the other option is to wait until post-closure to say that they did not do it correctly. Vince and Dirk will head the issue manager group to bring the issue before the Board; the committee will review the SST report early next year and work towards a public involvement piece.

Waste Management Area (WMA) C Performance Assessment (PA) Closure Schedule

Agency review

Chris spoke to the current continuing resolution in place for the Fiscal Year (FY) 2012 budget, noting that the current funds available for tank farms and retrieval and closure would not allow DOE to be Consent Decree or TPA milestone compliant. He said the President's budget of \$325 million for tank farms (of that, \$90 million for retrieval and closure) would allow DOE to remain compliant. Under the continuing resolution, only \$42 million is allotted for retrieval and closure. Chris noted that the Consent Decree has accelerated retrieval and closure, and DOE will need \$451 million in FY2013 to remain compliant. Chris said that when he speaks of the Consent Decree, he is referring to the judicial decree signed in October 2010 that accelerated closure of C Farm to 2013, required DOE to consult with Ecology on the next nine tanks for retrieval, and required the beginning of retrieval for five of nine tanks beyond C Farm; DOE-ORP will provide the decree to the committee.

Chris noted that with the budgets allocated from the U.S Senate (\$467 million) and U.S Congress (\$408 million), the middle ground budget would likely allow for Consent Decree compliance, which would need to be \$445 million for tank farms and \$70 million for retrieval and closure in FY2012 to keep on track for C Farm closure in 2014. Dan noted that it is not unreasonable to consider the continuing resolution will go into spring 2012, as it typically lasts for three to six months.

Chris provided the committee with copies of the Project Management Life Cycle Baseline FY2009-2013 (PMB). He explained that the document is accurate as of June 14, 2010 and is considered current. Chris said DOE is working with Ecology to be more efficient, and they have shown the committee logic diagrams and opportunity schedules, but the PMB is the only schedule approved right now. A new baseline schedule would require a finalization of a budget change request with the contractors, then a TPA Change Request process. Chris said the PMB addresses closure, including checklists for the National Environmental Protection Act (NEPA), State Environmental Protection Act (SEPA), and closure plans including the radiological waste determination. He said a review of the PMB shows that DOE is behind in schedule on the radiological waste determination process, due to the assumption that the TC&WM EIS would already be published and there would not be concern from DOE-Environmental Management (DOE-EM) on the C Farm PA. Chris explained how to determine DOE is behind schedule in the PMB.

Chris spoke to the schedule DOE-ORP provided to TWC during the last committee meeting, noting that that schedule was a wish list for what could get done by 2019 if there were no budget constraints. He said this schedule is completely unachievable given the outlook of the current budget. He said when the budget is confirmed DOE will come back to the committee with a completely different set of scenarios for a draft budget, given what can be accomplished by 2019.

Regulator perspective

Dan said that in regards to budget scenarios, the scenarios are set up by characteristics for scope of work and are put on a 'bucket list' for what needs to get done. He said the first draft schedule was predicated on the anticipated budget, and it will be updated when a firm budget is available. At that point, the agencies will be required to look at reallocations to determine which projects they think can get done.

Committee Discussion

- Dirk asked if the consequence to an inadequate budget has an impact on tank closure activities. Chris said that retrieval would take precedence over closure.
- Dirk asked when the Board or the public is included on status updates about DOE being behind schedule. Chris said the Board becomes aware when DOE provides status updates during committee meetings.
- Dirk asked when the waste incidental to reprocessing (WIR) document will be completed and released for public review and comment. Chris said in the 2013 timeframe after the PA is published.
- Liz asked how small yearly changes are incorporated into the end date of the TPA milestone. Chris said that unless the FY2012 budget ends up being \$521 million, he will have to fill out a Change Request for the TPA milestones. If the budget goes below \$425

million, which is required under the Consent Decree, he will have to appear in court for approval or disapproval of changing the Consent Decree. He said TPA milestone change requests are approved by the agencies, and Consent Decree changes are approved by a judge. He noted it is possible for both the agencies and a judge to deny the change requests. Liz said 2019 is going to be hard to meet and asked when that date will change. Chris said the agencies want to meet the 2019 milestone, but if they do not have the money or staff, they cannot do it, and they will know when the FY2012 budget is released. She asked how the change will be integrated without impacting all other tank activities. Vince asked about the programmatic impact, not just the impact to the schedule. Chris said that unless the FY2012 budget is \$521 million, there will be a programmatic impact and TWC has requested a DOE-ORP update on the impacts. Dan said that at this point, the programmatic impact cannot be characterized, as they will not know what will have to be moved until they have an actual budget number. Chris said safe maintenance of the site is required and is a bigger part of the budget than retrieval. He said that given the lowest projected budget number of \$395 million, retrieval would be slowed, but DOE would continue with bulk retrieval of C Farm tanks C107 and C112. They will then move onto C101 which will have two enhanced sluiceways. Under the \$395 million figure, DOE will not continue with heal retrieval, closure work, or work on the PA, as determined by management. He said that at \$408 million, the decision is to continue with PA work put more budget towards components and residuals.

- Vince asked about the sequencing of the documents, noting that he believed the TC&WM EIS was supposed to come out first, followed by the PA, then the closure documents. He said he thought the PA had to be done before starting the closure process, but that is apparently not correct. He said the schedule shows a parallel path, not a series. He asked if some of the closure documents can be worked on before the PA is complete. Chris clarified that the risk portions of closure plans cannot be completed until the PA is done, but they can start on the draft plans. Chris said that the final model runs needed for the risk portion will be completed in May 2012; draft closure plans will include draft model results until the final results can be plugged into the PA and closure plans in the 2013 timeframe. Chris said that a lot of activities occur in parallel in order to reach the 2019 milestone; ideally, the documents would have been done in a series, but the Consent Decree and TPA milestone do not allow it. Vince asked when the PA will actually be done, as the committee will need to weigh in. Chris said the final PA cannot be issued until the TC&WM EIS and final ROD are issued in the early 2012 timeframe, but DOE will continue to work on the PA, funding allowed, and will hope to have it released in the 2013 timeframe.
- Liz asked if when work runs in parallel to meet the 2019 milestone, there will be a chance that documents meant to influence each other will have less impact because they are not ready in time. Dirk said Liz's question has to do with the logic problem, because in a rush, documents will be produced that did not go through a full process. Chris suggested TWC look at the logic diagram and provide their thoughts on it when DOE comes back with a schedule driven by the current budget.

- The committee discussed how to move forward with the issue, noting that they need to understand how all of the related documents fit together before providing advice. Vince said the committee needs to know which documents to review and how they can prepare themselves for that review. Dirk, Vince, Chris, and Dan will work to determine next steps.

2020 Vision

Issue manager introduction

Harold noted that the Lifecycle Cost and Schedule Report was published last week; the report says that total site cleanup will cost \$115 billion, of which DOE-ORP side is \$63 million. Harold said many decisions will need to be made down the road, and they all relate to safety and end states. He said the 2020 Vision addressed getting the current WTP online safely. He said the Board has been asking for this type of planning a long time, as it shows what it will take to get the WTP and supporting facilities running, as well as their associated impacts. It also demonstrates what will be done with the waste after it is processed.

Agency presentation

Ben Harp, DOE-ORP, provided an overview of the 2020 Vision One System. He reviewed the vision's timeline, noting that the concept began in a WTP Federal Project Director Management Assessment that was presented to the November 2010 WTP Construction Project Review. The proposal was submitted March 21, 2011. The involved contractors will need to provide DOE-ORP with proposals to meet the vision. Ben said the performance of hot commissioning of the WTP will need to meet the Consent Decree milestone for initial plant operations.

Ben provided an overview of the 2020 charter and vision, noting that the charter requires:

- The integration of the DOE, WTP, and Tank Operations Contractor teams.
- The identification of the optimum approach to startup, commissioning, and turnover of WTP facilities to operations.
- That the teams and contractors work backward from 2020 to determine the best way to proceed from this point forward.

The 2020 Vision (November 2010) requires:

- The sequencing of the WTP Operational Readiness Review and the Consent Decree into a manageable, less complex package to improve ability to meet hot operation dates.
- The initiation of hot commissioning at the Low Activity Waste (LAW) facility (in 2016) ahead of the Pretreatment Facility.
- Achievement of Consent Decree milestones for hot start of WTP operations and for initial plant operations.

Ben spoke to the benefits of early LAW startup, noting that DOE-ORP will:

- Have an increased understanding of how WTP will operate and vitrify radioactive waste.
- Gain valuable lessons learned and best practices for the startup of more challenging facilities.
- Provide a more qualified and experienced operating staff.
- Reduce the risks to the Consent Decree milestones.
- Potentially create additional headroom for managing radioactive waste.

Ben's presentation included diagrams depicting the 2016 hot commissioning of the LAW facility, the LAW facility 2016 glass production process flow, the interim LAW pretreatment system, the interim LAW waste feed delivery system, the interim secondary liquid waste handling system, the integrated WTP hot commissioning transition, and the WTP integrated waste treatment process.

Ben reviewed the funding profile for tank farms, noting the differences between baseline costs, accelerated costs, and new scope work and savings.

Ben said the near term actions for the 2020 Vision include:

- Prepare the contractor proposals based on the DOE request.
- Implement the one-system organization immediately.
- Complete the independent government estimate within 60 days and evaluate the proposals and obtain business clearance before contract modifications are in place.
- Complete the down-select of the in-tank/at-tank pretreatment system (September 2011).

Regulator perspective

Dan asked committee members to consider the complexities of the permitting process as Hanford begins to look at everything from a one life cycle approach. He said turning over facilities at WTP for operations will go through many permitting conditions, validations, and verifications before the facility is turned on for use. He said 14 points in the operational readiness review are checked to make sure they have been done correctly. He said they need to figure out how WTP handles all kinds of wastes, and he hopes the down-select technologies can solve that problem. He said he would like to see an integrated schedule at different levels in order to see how it will be successful.

Committee discussion

- Harold asked if there is any additional funding coming to the overall site for the startup of LAW, and if not, which budget it will be taken out of. Ben said there is no additional funding coming to the overall site, but that early startup is being funded by DOE-Headquarters (DOE-HQ) because it is on their priority list.

- Dick said Ben had indicated that initial waste streams would be recycled back to tanks and asked if that was true. Ben said tank farms cannot handle recycling, but the Effluent Treatment Facility (ETF) is in the baseline to take secondary waste. Ben's reference to recycling the waste stream is for when all five facilities are operating at the same time.
- Al Boldt, Hanford Challenge, asked if the funding profile includes operations of WTP. Ben confirmed it does. Al said it must not include any of the accelerated costs for WTP. Ben said all cost effects are included in the profile, and WTP has always been scheduled to be done in 2016 for LAW. Ben said the WTP operation cost has always been accounted for in tank farm funding.
- David said he has been reviewing what kind of wastes ETF would take, and that from a whole systems operation standpoint, he believes it is already undersized by 20 to 50 fold. He said DOE should come up with a new secondary waste facility as soon as possible. Dan said they will not know what ETF can or cannot handle until the down-select reports are available. Ben said DOE will go through an alternatives process and will know what will go in and out of ETF before making a decision. Ben said the project has a manager and a schedule.
- Gerry Pollet, Heart of America Northwest, said he recently read a Washington River Protection Solutions (WRPS) newsletter that indicated they had already made a down-select decision. Gerry thought the TC&WM EIS was a pre-requisite for down-selects. He asked how Ecology will review permitting for the down-select. Ben said there will be design requirements in order to meet the down-select. Gerry said the TC&WM EIS about mitigating alternatives is crucial to choosing a down-select given the potential impacts to the secondary waste stream. He is unsure how Ecology can meet its review obligations without first meeting the NEPA and SEPA requirements of an EIS. Ben said the down-select can reach a certain point in design in order to submit a permit to Ecology, and there will not be anything to approve in the short term because the design is still conceptual. Dan said Ecology has not yet seen WRPS's down-select and will not be considering conceptual design permits. Gerry noted that it seems DOE is getting ahead of their timelines, and he would like to address this issue at a later date. Ben said it is important to prepare the facilities and waste feeds to be ready at the same time.

Technology Update

Steve Pfaff, DOE-ORP, provided a technology update for the TWC on 2011 accomplishments, plans for 2012, the supplemental pre-treatment and immobilization system, and secondary waste treatment.

Steve spoke to the testing currently being done by the Savannah River National Laboratory (SRNL) on rotary micro-filtration (RMF), noting that if Hanford moves forward with supplemental pre-treatment, Savannah River's technology would be a good example to follow. Accordingly, WRPS is nearly complete with the Supplemental Pre-Treatment Conceptual Design

Report, which includes the use of in-tank RMF and small column ion exchange. SRNL's testing is being done on a 25 disc rotary system which would be similar to Hanford's. Steve said SRNL's testing should be complete by September 2011, with a few projects carrying into 2012.

Steve said WRPS is collecting approximately 100 deliverables from laboratories, universities, and companies to close out FY2011 technology development efforts. These efforts included work in tank waste gas retention, improved actinide sorbents (SRNL), sludge leaching (to pre-condition the feed to the glass facility), next generation solvent, technetium recycle testing and retention in LAW glass (to determine what happens to technetium when it has been sent back to the waste feed), and fluidized bed steam reforming. Steve noted that steam reforming technology may have the capacity to trap flammable waste.

Steve spoke to technology development plans for FY2012, noting that technology development will be put on hold for the first quarter if the continuing resolution continues. He said they currently have limited carry over funding, and they are working on a priority list for the possibility of limited funding; the list includes development for a better understanding of technetium in glass, secondary waste immobilization, and the PA on the integrated disposal facility. Steve said DOE-ORP is working to integrate the tank farm and WTP technology development needs, and is emphasizing the use of their funding for technology application over new technology development. Steve said limited resources will be directed to moving necessary DOE-ORP projects ahead while maintaining compliance with Consent Decree milestones.

Steve said further work on the supplemental pre-treatment and immobilization system will likely be delayed until after the continuing resolution; WRPS's Supplemental Pre-Treatment Conceptual Design Report and other Consent Decree documents (15-20 in count), including nuclear safety reports, will still be delivered by the end of September. He said WRPS will also deliver the Supplemental Immobilization Technical Data Report in draft form, but further work on it in FY2012 is unlikely given the budget scenarios.

Steve said a down-select decision has been reached on secondary waste treatment. The decision is to perform upgrades on the ETF with the addition of a solidification unit to produce a monolith waste form for the Integrated Disposal Facility; this is the most cost-effective and achievable option. Other alternatives included significant additional use of the 242-A Evaporator, a new evaporator, fluidized bed steam reforming (most expensive option), and a new ETF. DOE-ORP hosted an informal independent expert panel to review these alternatives. Steve noted that alternatives analysis on the solidification technology remains to be performed.

Steve spoke to development in steam reforming, noting that current testing is using actual waste samples, while previous efforts did not have the correct waste samples available. Steve said waste samples have been modified to look like waste feeds that will be produced by WTP. Steve said some would argue that steam reform technology development is a waste of time if the technology does not end up being cheaper than using glass logs, but he believes the continued development of steam reforming is necessary to make the value determination. He said that while steam reforming does not trap 100 percent of contaminants of concern, it does show good

performance in short term testing, but there currently isn't funding to move forward with long term testing.

Regulator perspective

Dan said that at this time Ecology will require 80 percent design maturity before considering design and construction permits.. He said they will wait for a mature design and a confirmed budget before moving ahead with permitting.

Committee Discussion

- Dirk asked what will happen to technetium independent of which solid waste form is selected, noting that Hanford is already over the limit of technetium in soils, and adding any more will be a problem. Steve said it would be unreasonable for DOE to say they will not put another curie in the ground for technetium. He said he is not sure of the specifics for groundwater and the vadose zone, but he thinks DOE will want to find a solution to implement in the near term instead of holding off for a technology with zero risk.
- Dirk referenced a new cationic exchanger technology that binds technetium 20 times better than anything previously studied. He suggested Steve look into this new form.
- Al asked if in addition to technetium, DOE-ORP is also working on technology for iodine 129. Steve said initial test results showed the steam product captures iodine better than what was expected. Al asked if the steam form captures iodine better than glass would. Steve said glass has trouble capturing iodine, along with a few other contaminants of concern, which are also being evaluated. Al suggested DOE examine sulfate in its different mineral phases.
- Dick said technology development for technetium seems to be going in the wrong direction, because testing moves toward using a higher melt temperature, which drives technetium out of the melt and into the secondary waste stream. He said technetium needs to be captured in a safe and sanitary manner. Dick said that in terms of iron phosphate and glass, small scale studies at the Idaho National Laboratory and the Pacific Northwest National Laboratory showed melting is successful with the worst of tank contaminants. Testing showed the ability to operate at lower temperatures. He suggested DOE examine the new studies. Dan said he is aware of the studies Dick referenced and noted that there is still some concern about being able to extrapolate the contaminants at a workable level. He said the reports of the two laboratories seem to conflict. Dick noted that using different lengths of melting could make a big difference for what glass captures.
- David said the prediction is that 47 curies of technetium will go to secondary waste, which means that 99.8 percent of technetium will go to LAW and a high level waste facility. But he noted that it looks closer to only 93 percent going to the facilities and DOE will have to examine that. Steve said technetium recycling testing will provide real

numbers to work with, and small and large scale testing will indicate what can actually be achieved.

- Dirk said he has read some research that indicated that avoiding having both cesium and technetium in the waste being vitrified at the same time allows for more incorporation of the technetium into glass. He suggested DOE plan to separate the contaminants for different times and places in order to cut down on the recycle loop.
- Liz asked when DOE determines to give up on certain technologies, like steam reforming, which seems to be a useless alternative. Steve said there are political realities that play into alternative development, but he understands why leaders examined alternatives to a glass facility, as glass is very expensive. He said testing for steam reforming has improved and they will finally have real answers to its cost savings, which may not end up impacting the total project cost by much. He said short term testing shows steam reform is better than glass, but it may not be in the long term.
- Dirk said that the TWC does not support the use of grout vaults, and noted that when the first million gallon grout was poured, there were many issues that led to the failure of the project such as technetium seeping into the environment. Dirk said it is important to remember the history before considering grout further. Steve said that grout vaults and salt stone disposal are not planned to be used at Hanford like they are at the Savannah River Site, which has different regulatory standards.
- Liz asked how TWC input will help technology development. Steve said advice indicating a desire for robust waste forms that meet regulations and have long term performance would be helpful. He said attending TWC meetings helps him to understand the Board's consistent cleanup values. Dirk asked how the Board can help the technology process in the upcoming months. Steve said that if DOE selects an alternative or to study a technology that is not feasible, he hopes the Board will bring light to the issue using their regulator and political influence. Steve said that as a private citizen, he would hope that the agencies making decisions have scientific proof as their baseline; he said the Board could ask DOE to provide validation for their assumptions.
- Dirk said in regards to WMA C and other projects, modeling has been done with the intent of justifying the concept that was implicated, and the conceptualizations used are at odds with reality. He said he does not know how anyone can have confidence in those outcomes. David said DOE selects leak volume estimates to support the conclusions they want. Dirk said it seems DOE's values seem to be to focus on what is of a minimum cost that barely meets minimum standards. He is concerned about trying to involve the public to better inform decision makers on the public's values when the first time the Board hears about a decision is after it has been made. Steve recommended having DOE present project statuses to the Board sooner. He noted that the decision for ETF is a few months away and he will provide the documents to TWC.

- Dirk said that intentionally contaminating a water resource to above drinking water standards is wrong; waste needs to be contained. He said DOE should destroy toxic materials and apply methods that more permanently bind the wastes. He said the IDF disposal facility was placed where it will not exceed drinking water standards because there is a lot of dilution. But the Environmental Restoration Disposal Facility was placed on the best part of the site for immobility. Dirk said one of these facilities is located in the wrong place whatever the criteria is.
- The committee discussed how to proceed with technology development. Steve said he will locate the schedule for the solidification alternatives analysis report and provide them to the committee as soon as they are made public.

Committee Business

- Cathy spoke to the Board priorities and how many of the issues are crosscutting and important to TWC. She said the committee needs to decide if they need an October committee meeting, noting that the Budgets and Contracts Committee (BCC) has requested TWC's input on the Lifecycle Cost and Schedule Report, and October would be an appropriate time to address it in time for the November Board meeting. Pamela McCann, DOE-ORP, noted that the DOE-ORP portion of the report will not be available until January 2012 report. The committee decided to receive an update from the report issue manager, Harold, and discuss the relevant tank issues during the October meeting.
- The committee discussed the timing of comments for the Lifecycle Scope, Schedule and Cost Report, noting that any comments provided now could only be incorporated into the 2013 report. Comments received through April 2012 will go to the 2013 report. Dirk said it is important to remember that the Board will have more than one opportunity to influence the report, as a new iteration will be published every year.
- The committee comprehensively updated their 6-Month Work Plan and October Meeting Topics Table. They worked to align items in their work plan with the FY2012 Board Priorities.
- The committee agreed to a full-day meeting in October and to cancel the upcoming committee call.
- Cathy reminded TWC members about the joint topic with the Health, Safety, and Environmental Protection Committee (HSEP) taking place at 9:10 a.m., September 14, at the Richland Library on WTP safety culture issues.

Handouts

Hanford Advisory Board Priorities
 Tank Waste Committee – 6 Month Work Plan

Project: SLCS-BL Life Cycle Baseline FY09-13 8/29/11
Project: OPER-BL Out Year Planning Estimate Range
2020 Vision One Year System Overview
DOE-ORP Technology Update for TWC

Defense Nuclear Facilities Safety Board (DNFSB) (joint topic with Health, Safety and Environmental Protection Committee)

Issue manager update

Dirk Dunning, Oregon Department of Energy and Tank Waste Committee (TWC) Chair, noted the importance of the topic to HSEP, the TWC, and the Board. He provided a history of the topic: in summer 2010, the DNSFB announced that they would be investigating allegations of safety issues at the Hanford Site because of concerns that had been filed. In October 2010, the DNSFB held a two-day hearing in the Tri-Cities, and HSS began their own investigation. Through the winter of 2010 and 2011, the DNSFB solicited testimony from many people and requested public comment; most of the comments and testimonies are available on the DNSFB website. The website also features technical information that provides an indication of what the HAB should be concerned about. In February 2011, the DNSFB issued a letter on questions of the large scale testing on site. In June 2011, they issued recommendations with a long list of items that are technical and of concern. DOE responded to the recommendations saying that they disagreed with some of the findings and are operating safely on site.

Dirk said Bechtel National, Inc (BNI) recently announced the formation of an independent expert panel, mostly comprised of former senior staff members of the Nuclear Regulatory Commission (NRC). This panel will be examining nuclear quality and safety criteria. Dirk said he is struck by a photo that demonstrates safety concerns. The photo is of test equipment with holes in the piping where erosion has occurred in the side of the metal. Dirk said there have been multiple statements about what happens when mixing solid wastes, and the contractor has said they are moving forward with full scale mixing tests, which is a sizeable project with a large budget. Dirk recommended that the Board should ask what the testing work is and what it should be. Dirk also asked what the Board's policy level concerns are with the Waste Treatment Plant's (WTP) safety. He said he has a concern with the black cells operating alone for 40 years. He said he thinks comments from the Board could focus on DOE and contractors providing joint information for the public that gives assurance WTP will be safe and on schedule.

Cathy said she would provide the DNFSB letter and DOE's response letter for committee members who want more background information.

Committee Discussion

- Liz Mattson, Hanford Challenge, said a public involvement process for the WTP will be crucial for sharing information and receiving feedback. She said the issues are complex and they deserve public awareness.

- Susan said a DOE presentation on the issues would be helpful in assisting the committees craft policy level advice, and she asked that DOE provide a presentation during October committee week. She said that with so much negativity surrounding WTP, the committees should ask DOE, on behalf of the public, if WTP will meet their expectations, not just as designed, but also for processing most of the tank waste. She said that the public is spending billions of dollars on WTP and they need to be provided with a comfort level.
- Keith noted that the design of WTP has changed extensively from the original design, and the public and the Board need to understand how the design changes are better or different. He said many of the design changes were in order to take most of the processing out of the black cells and into something where the equipment can be maintained. Susan said she receives many calls from the public, who think WTP will process 100 percent of the tank waste, and that belief needs to be clarified if it is not the case. She said she has seen an increased level of public interest in the WTP as compared to 15 years ago. Liz asked the Tri-Party Agreement (TPA) agencies if the public actually knows what WTP is. Erika Holmes, Washington State Department of Ecology (Ecology), responded that people in the Tri-Cities are aware, but outside of the area, most people believe it is a sewage treatment plant. Liz noted that the public should be made aware of WTP and in the overall context of tank closure.
- Tom Carpenter, Hanford Challenge, said that there has only been one meeting (October 2010) where public comment was taken on the WTP; the meeting was hosted by the DNFSB, not DOE. Tom said Hanford Challenge's main interest is a safe and effective WTP. He said the issue of "safety culture" has been investigated many times and is currently being investigated by many different parties. He said that with so many quickly moving parts, he does not know how useful it will be for the Board to weigh in except with overall values. But the advice should acknowledge a good, strong safety culture and that DOE should take measures to get the WTP on track to where everyone is comfortable. Tom said the DNFSB noted in its June 9, 2011 letter of recommendations that if the safety culture at Hanford is broken enough, it will threaten the viability of the WTP. He said everyone agrees on the importance of safety culture, but reaching safety culture is another issue.
- Dick Smith, City of Kennewick, said that the major testing program for the mixer system is going to take a year or more, and it will be prudent for DOE-Office of River Protection (DOE-ORP) to evaluate their back up plans should the system fail to function as advertised. He said the Board would like to hear the other viable possibilities as soon as possible.
- Susan recommended that the issue manager group assigned to how the Board moves forward safety issues at WTP examine the recommendations of the DNFSB to see where their issues coincide with the issues of the Board. She said the recommendations could be used as a framework to determine if Board advice should come forward. She also

recommended that the issue manager group examine a report due to Ecology in October 2011 about the viability and functionality of the WTP. She noted that this DOE report may not be available to the Board until January. Dan McDonald, Ecology, noted that the report is due under TPA milestone M-62-49. Carrie Meyer, DOE-ORP, said some of the information contained in the report would be addressed in an update to the Board in November.

- Dirk spoke to the timing of commenting, and noted that comments could be provided one time, or over a period of time. He said the Board and the public should be involved in these issues for the long term. He said some of the issues associated with WTP include the cost and schedule, and the more technical issues like pulse jet mixers; TWC will receive an update and discuss pulse jet mixers in October. Dirk said the Board should be asking DOE about their priorities related to WTP and what will happen when those priorities are impacted by funding. He said he learned at the TWC meeting on September 13 that the court decision or Consent Decree for tank waste takes precedence over the TPA milestone when funding falls short; this creates a complexity for the schedule. Dirk noted the importance of timing and ripple effects to other projects.
- Liz said she would like to see advice come forward for the November Board meeting to acknowledge the complex interplay of technical issues, budget uncertainties, schedule concerns, and the desire for a transparent and accountable process to ensure there is a clear and technical process to treat tank waste. She said she is not as concerned with budget and schedule as she is with safety and technical issues, as safety and a technical process will be what ultimately ensure that WTP works. Susan reiterated that it is very important to understand that everyone involved wants WTP to work. She said the Board needs to make recommendations that will not delay WTP.
- Dirk asked if the Board and the public would want to weigh in on the different types of risk: technical risk versus programmatic risk. He provided an example of closing up cells with five-foot thick walls and trying to get back into those cells now versus later. Carrie responded that in regards to vessel welding, there is a manhole to allow access into the walled off tanks. She said the five tanks represent \$30 million in procurements, and it will cost \$1 million to remove the vessel heads. She said the vessels will not be installed until DOE is sure they will meet all of the safety requirements, but that if they do not proceed with the vessels at this point, they may be removed from the vendor queue, which could translate into a \$200 million impact. Dirk said that decisions made now will impact the vessels down the road, and he is concerned about the ripple effect. Carrie noted that there are two hold points in place for the vessels: one to make sure everything is considered before a decision is made and one before the vessels are installed. Tom said there was a holding point in place for capping the tanks, but DOE moved past it. He asked what is to stop them from using the same logic for the next hold point. Carrie said she agrees with Tom, and it is necessary to weigh all of the information available at the time. Dirk said the Board should emphasize that they want WTP to operate and be on schedule, but that they would like answers to their questions before decisions are made.

Carrie suggested that DOE provide TWC and HSEP with a one-system presentation in October on how the agencies are working in tandem with tank farms to meet WTP and tank farm safety requirements.

- Liz said it is important to note that the deadline for cleanup keeps moving and is being shifted onto future generations. She said the thought of who is inheriting tank waste and WTP completion needs to be kept in mind when making short term decisions based on funding.
- Keith said he has had many conversations with Board member BC Smith, Hanford Work Force, who is a construction representative. They have spoken about how safety culture for Hanford workers has greatly improved. Keith has heard technical complaints, like using the number of accidents to rate workers for re-hire, which is more of the workers' union view. He has also heard from a site foreman that Hanford is over safe. Keith noted that it is irritating to someone who wants to get their job done when it takes three days for approval to hang sheet rock. But this indicated that there is close scrutiny being paid to worker safety compared to when the Board first started talking about safety culture with the workers.
- Sam Dechter, Public-at-Large, noted DOE's response to the DNFSB recommendations, saying there is nothing in the response to indicate that DOE is doing anything new; all solutions for safety culture have been done before. Sam cited a 1993 event called Rock on a Rope that in post-analysis, pointed out a chain of safety concerns. At the time, the answer to the problem was to stop work immediately, independent of cost and schedule. Projects were not re-initiated until workers felt they were safe. Sam said it took six months for the site to run smoothly again. Sam also spoke to the difficulty of safety culture issues being solved by executives who never step foot on site. He said there have been many initiatives to better site safety, like behavior based safety and contract rearranging, but there is always the problem of schedule and cost taking priority, which causes managers to ignore safety. Sam said the point of safety culture is to have every worker go home at night in the same condition as when he arrived on site. Sam noted that members of the DNFSB are conservative and technically competent, so the agencies and the Board should take their concerns into account. Suzanne Heaston, BNI, commended Sam's observations and said that because of the recommendations, BNI has looked into first level supervisors and have sent over 400 people to first line supervisor training for safety. She said that when it gets down to it, safety is addressed through project management, which is why the supervisors should be trained in safety culture. She said safety and quality are never at the expense of cost and schedule, and BNI is working towards new and innovative ways to accomplish it.
- Pamela McCann, DOE-ORP, said it would behoove the committees to document a path forward, raise their questions to the agencies, and allow DOE to present back on the answers. She also noted that HSS is conducting an effectiveness review to determine if the corrective actions they recommended have made improvements to safety culture on

site. Liz said she will know there have been improvements on site when workers with dissenting opinions bring their concerns forward and are not punished for them.

- Keith said he would like to see safety culture provided at the same level of effort for both union represented employees and non-union employees.
- Dan said that ISM is a big deal on site, but that in the hierarchy of program, project, activity, some issues get addressed and some do not. He said the Board and the agencies should ask if the ISM framework is still functional where it is being applied. The next question should be if the application of the infrastructure is functional. He said applying safety through ISM will only work if both the infrastructure and the application are functional. Dirk said he is not enamored with ISM because it is cumbersome, but noted that insurers ask how ISM works because Hanford has a lower accident rate than banks. Dirk said Hanford needs to be mindful of what can be accomplished in the context of what they have. Keith said that these issues are addressed in the presentation Mike Korenko, Public-at-Large and HSEP vice chair, is presenting at the ISM conference. The presentation will be shared with HSEP at a later time.
- Tom said that apart from safety behaviors on an everyday basis, there is also an issue of if someone sees something unsafe, will they report it. Tom referenced a 1998 review of safety, a 2000 hearing on tank waste remediation systems, and a subsequent congressional hearing on safety culture where they said they would review retaliation. Congress also said that the review cycle begins with understanding reform. Tom said DOE always seems to forget to follow through on reforms or address angry issues of retaliation. He said he agrees with Sam that there needs to be more innovative ways to apply safety culture, not just programs or trainings.

Cathy noted that Dirk, Rebecca Holland, Sam, Liz, and Susan will act as issue managers for the safety topic, and they will hold an issue manager meeting with DOE-ORP before receiving a one system presentation in October. The presentation will be a joint topic for HSEP and TWC.

Attendees

Board Members and Alternates

David Bernard	Dirk Dunning	Vince Panesko
Allyn Boldt	Harold Heacock	Gerry Pollet
Tom Carpenter	Susan Leckband	Dick Smith
	Liz Mattson	

Others

Ben Harp, DOE-ORP	Dan McDonald, Ecology	Cathy McCague, EnviroIssues
Chris Kemp, DOE-ORP	Ginger Wireman, Ecology	Jessica Ruehrwein, EnviroIssues
Pamela McCann, DOE-ORP	Sharon Braswell, MSA	Melissa Thom, EnviroIssues
Carrie Meyer, DOE-ORP	Michele Gerber, URS	Joni Norton – DOE-ORP
Steve Pfaff, DOE-ORP	Shannon Cram, Public	