

FINAL MEETING SUMMARY

**HANFORD ADVISORY BOARD
TANK WASTE COMMITTEE**

*April 27, 2016
Richland, WA*

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

Opening

Bob Suyama, Tank Waste Committee (TWC) chair, welcomed committee members and introductions were made. Committee members adopted the February and March 2016 TWC meeting summaries.

Announcements

Carrie Meyer, U.S. Department of Energy – Office of River Protection (DOE-ORP), announced that Chris Kemp, DOE-ORP, would give the TWC a brief update on tanks AY-101 and AY-102, in addition to his presentation on tank waste retrieval technologies and closure regulation processes later that afternoon. On April 17, 2016 an alarm sounded, notifying workers of leaked waste in the annulus of double-shell tank (DST) AY-102. Approximately 3,000 – 3,500 gallons of waste had leaked into the annulus of the tank. On April 21, workers began pumping waste from the annulus space of tank AY-102 back into the primary tank using the annulus pumps, which were pre-installed for just such a contingency. Workers also resumed operations to remove waste from the primary tank to another DST.

Carrie also noted that a recent reading from a ventilation filter in DST AY-101 indicated contamination in the annulus. A visual inspection was conducted. On April 25, 2016 DOE-ORP received an engineering

evaluation of the visual inspection of tank AY-101's annulus, indicating that no waste had been detected. DOE and Washington River Protection Solutions (WRPS) are continuing to investigate the source of contamination.

Effluent Management Facility Update

Bob Suyama introduced the topic on the updates to the Effluent Management Facility (EMF).

Agency Presentation

Jason Young, DOE-ORP, provided TWC members with an update on the EMF. During his presentation, Jason provided a video that included an overview of the EMF as well as the process for treating low activity waste. Key points from his presentation¹ included:

- In order to achieve DFLAW, modifications need to be made to the Waste Treatment Plant (WTP). These modifications include an ability to concentrate incoming liquid effluents, reduce the outputs, and provide additional isolations within the WTP to ensure safety of the site.
- Low-activity waste (LAW) facility produces a large volume of liquid as part of the off-gas process. The EMF contains a vacuum evaporator which removes, concentrates, and directs the secondary effluents to the Liquid Effluent Retention Facility (LERF). Concentrated materials will be returned to the waste stream to be treated at the LAW facility.
- One objective of the EMF is to not send effluents to tank farms. However, the facility will have the capability and flexibility to chemically adjust effluents and temporarily send the effluents to tank farms, in the event that liquid effluents are not able to be concentrated.
- The bottom product from the evaporator will be directed to a series of three concentrate vessels. The vessels are designed to receive and recycle waste materials, ensuring that the concentrate is appropriate for returning to the LAW-feed stream.
- Long runs of waste transfer lines will need to be flushed after the transfer of waste is complete. EMF's design will allow for the flushing of the transfer lines into the low point drain. The material will be concentrated in the evaporator and recycled into the LAW-feed stream.
- The excavation process in order to construct the EMF was accomplished in late 2015. Excavation activities are in progress to install the low point drain, provide external ventilation and electricity to the facility, and prepare the mudmat to support the EMF.
- Recent accomplishments include:

Attachment 1: Effluent Management Facility Overview

- Completed the contract milestone, DF-02, containing the EMF hazard analysis and 30% design review
- Completed bulk excavation and the mudmat placement
- Completed and approved the initial Preliminary Design Safety analysis
- Currently, the facility's design is 45% complete. The DFLAW design completion is set for April 30, 2018. Components for the EMF's timeline include:
 - Submittal of a series of permits to Ecology to allow the placement of structural concrete, placement of radiological material transfer lines, and placement of dangerous waste handling equipment inside the facility by October 2016.
 - Complete civil and structural construction by May 2018.
 - Place vessels and install the evaporator by June/July 2018.
 - Complete the turnover from construction to facility startup by June 2019.
 - Complete EMF commissioning to support LAW by January 2020.

Agency perspectives

Dan McDonald, Washington State Department of Ecology (Ecology), clarified the permitting process for the EMF, noting that the submittal of the permits does not constitute approval to begin construction of the facility. Dan stated that Ecology is examining the facility's schedule, progress, and opportunistic approaches in order to fulfill the milestone.

Committee Questions and Responses²

Note: This section reflects individual questions, comments, and agency responses, as well as a synthesis where there were similar questions or comments.

Q. Given the need for 30 metric tons of waste to feed through the LAW facility, how much liquid waste is expected to feed through the EMF on a daily basis?

R. [DOE-ORP] The volume of liquid waste to feed through the EMF on a daily basis is not known at this time. The EMF is sized from moving effluents from the LAW facility with two melters, when fully operational. The size of the EMF evaporator is the same size as the evaporator in the treated LAW evaporation process system, which can handle the effluent from the LAW facility.

Q. What is the design life for the EMF?

R. [DOE-ORP] The planned operational timeline for DFLAW is ten years. However, nothing within the EMF is limiting its longevity. The facility design includes keeping EMF as backup to the Pretreatment Facility (PTF), in the event that an outage occurs.

Q. What is the anticipated percent reduction of effluents in the evaporation process?

R. [DOE-ORP] The reduction is approximately 95%. The EMF is not concentrating waste. The water will contain some contaminants and the contaminated water will be processed in the overhead evaporator and sent to LERF.

Q. The video during the presentation showed the analytical laboratory; will the laboratory be operational at the same time as the other facilities necessary to perform the DFLAW process?

R. [DOE-ORP] Yes, the laboratory will be used to support processes within the EMF. The LAB will support the LAW facility in addition to sampling from the EMF.

Q. How mature is the technology that will be used in the EMF? Will new technology have to be invented or does it require industry-standard materials?

R. [DOE-ORP] The evaporator and other equipment in the facility are similar to the industrial standard. However, the size and volume of the technology has been challenging due to the scale of the facility. Challenges associated with the schedule for completion are more concerning than technological challenges.

Q. Are there similar issues and challenges between the EMF and the PTF?

R. [DOE-ORP] The issues with the PTF involve mixing and handling of waste, and the storage tanks in the upfront process. The technical issues in PT do not affect the evaporators. Additionally, the EMF evaporator is only concentrating off-gas effluent rather than high-level or low-level waste.

Q. What will occur if the EMF is not successful?

R. [DOE-ORP] The DFLAW process is highly dependent on a successful EMF. The need for EMF arose during the evaluation for DFLAW.

Q. Are the necessary funds secured to see the EMF through construction and the PTF?

R. [DOE-ORP] Funding will continue to be a challenge. However, DOE-ORP is focused on supporting DFLAW and views this process as a priority.

Q. Is there adequate communication between DOE-ORP and the regulating agencies for this project?

R. [Ecology] Yes, communication pathways are improving.

Q. What is the estimated amount of effluents on the bottom concentrate? How much additional glass will be generated by this output?

R. [DOE-ORP] The concentrate is designed to return to LAW. DOE-ORP is investigating methods for concentrate disposition to optimize low activity waste treatment. DOE-ORP is still in the process of evaluating the estimated amount of additional glass that will be generated by this output.

Q. Will the Hanford Advisory Board (HAB or Board) be notified of the comment periods during the permit process?

R. [DOE-ORP] There will be two separate public comment periods after the Secondary Containment Permit is submitted to Ecology. The comment period schedules may be outlined at the upcoming HAB Leadership Workshop.

Committee members thanked Jason for his presentation and comments. Members identified interest in receiving routine updates on the various facilities integrated to support DFLAW processes. Ecology and DOE-ORP noted that regular updates on the overall DFLAW process, as the project progresses, will be an item discussed for the upcoming Fiscal Year (FY) 2017 work plan.

Leadership Workshop Preparation, FY 2017 Priorities

Environmental Management Site-Specific Advisory Board (EM SSAB)

Steve Hudson, HAB chair, informed the TWC committee of several key points from the EM SSAB meeting that took place on April 19-21 in Oak Ridge, Tennessee. Steve noted that the U.S. Department of Energy – Headquarters (DOE HQ) will be requesting briefings from site-specific advisory boards, focusing on three key areas including:

1. Recommendations for Environmental Management strategic planning and communication regarding future Site cleanup
2. Statement on the priorities and values for the transition to a new presidential administration
3. Best practices for transitioning from a nuclear waste facility to community reuse or reindustrialization

Steve noted that the product pertaining to the priorities and values for the transition to a new presidential administration is a time-sensitive document and is due to the EM SSAB by August 2016. He also mentioned that DOE HQ is adjusting how documents are published and how information is shared.

Fiscal Year 2017 Priorities

The TWC discussed preliminary topics for the Board's FY 2017 work plan. These topics include:

- Consent Decree milestones and supporting activities such as:
 - Major components, infrastructure, permitting processes, funding, critical decision pathways
- Understanding DOE HQ's goals and regulatory agencies' requests such as:
 - Writing white papers vs. advice
 - Level of technical content
 - HAB composition and communication with new Board members
- Status updates on the DFLAW process including:
 - Permits, progress on facilities, technical findings, critical decision processes, sequence of events, storage of waste and products
- Status updates on the risk-based retrieval and closure for tank waste including:
 - Changes in single-shell and double-shell tanks, soil contamination, performance assessment, and groundwater
- Status updates on the investigation of leaks in single-shell and double-shell tanks
- Status updates on the resolution of the WTP technical issues including:
 - Construction progress, arising issues, grand challenges, full scale vessel test, C5 ventilation system
- Status updates on the pending resolution of the tank vapors safety issue
- Status updates on the direct feed high-level waste grand challenge
- Updates on the Waste Isolation Pilot Plant (WIPP) disposition including:
 - New waste stream acceptance criteria
 - Schedule for Hanford waste

Bob Suyama and Melanie Myers-Magnuson, TWC vice chair, will present these topics as priorities for the FY 2017 work plan agenda at the upcoming Leadership Workshop.

Committee Questions and Responses²

Note: This section reflects individual questions, comments, and agency responses, as well as a synthesis where there were similar questions or comments.

Q. Coming out of the Consent Decree, it feels as if the TWC is regrouping. What do DOE-ORP and the regulatory agencies see as priority work plan items that the HAB can provide input on?

R. [Ecology] It would be beneficial for TWC members to review the old and updated version of the Consent Decree, as well as review the milestones and the implications of those milestones. Due to recent changes in the Consent Decree, the content in the Tri-Party Agreement (TPA) no longer matches the content in the Consent Decree. Review the TPA and the Consent Decree to determine what components no longer exist and what the HAB may need moving forward.

C. [DOE-ORP] Ecology and DOE-ORP are in communication to design a flow for a more efficient and streamlined permit modification process. Until a detailed timeline or schedule is released from DOE-ORP, there is not enough information for Ecology to advance the process.

R. TWC members need to know what the agencies are evaluating and what they see as a problematic structure, in order for the HAB to be able to contribute to the process.

C. [Ecology] Ecology is looking for efficiencies in the permits for the EMF. Ecology has not received enough detailed design and scheduling information from DOE-ORP. That information is precursory to how Ecology will operate moving forward with this facility.

C. [DOE-ORP] It would be helpful for members of the HAB to understand the processes the agencies go through, in order to provide a third party perspective and to identify possible efficiencies that neither agency can detect, in the form of informal advice.

C. Based on the discussions at the EM SSAB meeting, it appears that DOE HQ is not satisfied with the work produced by the HAB this past FY. The HAB has been halted due to the litigation involving the Consent Decree, resulting in lost opportunities for the Board to provide feedback to DOE HQ. The HAB does not want to deliver advice that is not effective or warranted by the agencies involved.

R. [DOE-ORP] DOE-ORP has been specific with the HAB to not produce advice that DOE does not request. The agency does not want to waste Board members' time if DOE cannot implement the advice the HAB produces. Ecology has also been halted due to the litigation involving the Consent Decree. Coming out of the litigation now, the FY 2017 work plan is very important.

R. The HAB looks to the advice produced as a form of accountability, in order to fill the Board's mission. When only a few pieces of advice are produced, it shows as a lack of accountability. In addition, younger members are joining the Board and there are time constraints on how members participate. It does not work well to try to establish advice over the phone.

Attachment 2: Transcribed Flipchart Notes

C. [DOE-ORP] Although the litigation surrounding the Consent Decree existed in the last FY, the work plan established for FY 2016 worked well. There are two white papers coming to closure from the TWC and DOE-ORP has found it valuable to provide the TWC with updates to inform white paper development. Ecology would like advice on certain work plan topics and in addition, to receive informal feedback as Ecology briefs the TWC moving forward.

R. There was confusion about what was being asked of the TWC, in regards to the cesium disposition white paper. There are some members of the HAB that can provide technical input on an assignment such as that, but it does not apply to all members of the HAB.

C. It would be helpful to have a visual roadmap, showing the forward direction of the HAB and the agencies.

R. [DOE-ORP] DOE-ORP is developing a strategic outreach plan for the upcoming FY that outlines events and when they are scheduled to occur. This plan can be shared with the HAB. However, there are blind spots to the plan because the regulatory information is complex. DOE-ORP could develop a roadmap that is similar in nature to the strategic plan, but for general public consumption.

Overview of Tank Waste Retrieval Technologies and Tank Closure Regulation and Process

Bob Suyama introduced the topic on the risk-based tank retrieval and closure process. Bob noted that in January 2016, the TWC received a briefing from Chris Kemp, DOE-ORP, on the C Tank Farm performance assessment. TWC members expressed interest in receiving an update on regulatory guidelines and the applied cleanup techniques. In addition, Chris Kemp provided brief status updates on tanks AY-102 and AY-101, due to recent leak detections and higher than normal radiation levels.

Agency Presentation

Tank AY-102 Retrieval Update

Chris Kemp provided TWC members with a brief update on the retrieval process of tank AY-102. Key points from his presentation³ include:

- Tank AY-102 had evidence of leaking 60-70 gallons of waste into the annulus, a 2-foot-wide space between the walls of the double-shell tank. DOE-ORP began work to pump waste out of the tank in March 2016.
- The waste level detection alarm sounded at 3:30am on April 17, 2016, alerting crews that approximately 3,000 – 3,500 gallons of additional waste leaked into the annulus.

Attachment 3: AY-102 Retrieval Update

- The waste located in the annulus is currently being pumped out, while workers continue to retrieve waste from the primary tank. The waste retrieved from the primary tank is directed to tank AP-102, located about a quarter of a mile away from tank AY-102.
- Tank AY-102 had approximately 744,000 gallons of waste. As of April 26, 2016, the tank has 41,000 gallons of waste in the primary tank. 38,000 gallons contain sludge. Approximately 95% of the waste from tank AY-102 has been retrieved.
- DOE-ORP has evaluated the tertiary leak detection pit, located outside the walls of tank AY-102. Evaluations indicate that no waste has leaked outside of the tank walls nor into the surrounding environment.

Committee Questions and Responses²

Note: This section reflects individual questions, comments, and agency responses, as well as a synthesis where there were similar questions or comments.

Q. Were samples taken from the tertiary leak-detection pit? If so, did the samples indicate change in the pH due to the presence of nitrate, in addition to presence of radiological material?

R. [DOE-ORP] Samples were taken from the tertiary detection pit. There was no indication of a pH change nor indication of radiological material in the AY-102 leak detection pit. DOE will need to check to see if testing was done for nitrate in the leak detection pit.

C. Is there still a concern about the thermal heat load of tank AY-102?

R. [DOE-ORP] In 1999, workers pumped about 150,000 gallons from a high heat tank, C-106. Prior to sluicing in 1998 and 1999 approximately 8,000 – 10,000 gallons of water was distributed into Tank C-106 on a monthly basis to maintain a cool temperature. DOE-ORP is working to maintain the temperature and monitoring the temperature in the primary and annulus portions of tank AY-102. The temperature has been monitored and is currently well below the thermal heat load threshold.

Q. What is the volume of waste in the annulus?

R. [DOE-ORP] The volume of waste is between 5 and 8 inches and it continues to vary as the waste is pumped out.

C. The waste retrieval of tank AY-102 is a great success story. The TWC has studied this tank for quite some time and is appreciative of the work being performed.

Q. How much material was in the annulus when workers began to pump the waste out? What level can the waste be pumped down to?

R. [DOE-ORP] On April 17, 2016 the material in the tank reached 8.3 inches. When workers began to pump, the level dropped to 6 inches. The waste can be pumped down to 2 inches.

Q. Does DOE-ORP anticipate additional leaks or for the material to build up again in the annulus?

R. [DOE-ORP] As retrieval continues we anticipate some additional supernatant moving from the primary tank to the annulus.

Q. If it is known where workers are sluicing, can the crack in the tank be monitored?

R. [DOE-ORP] Potentially. Workers will need to remove more sludge from the tank to finish retrieval.

Q. How often are waste level measurements taken?

R. [DOE-ORP] Measurements are continuously being obtained. The results are viewable through an automated program that is accessible via computer.

Q. What is the process after tank AY-102 is emptied?

R. [DOE-ORP] According to the settlement agreement, tank AY-102 has to have pumping completed by March 4, 2017. DOE-ORP would like to achieve that goal by months in advance. In the settlement agreement, Phase 3 describes whether the tank can be recovered and put back into service or if it needs to be “closed” once emptied. Tank AY-102 is not at Phase 3 yet. Studying the processes of retrieving waste from tank AY-102 presents learning opportunities when retrieving waste from other tanks in the future.

Q. Tank AY-102 was meant to be a primary tank for the WTP. What is the current alternative if tank AY-102 is not recovered and cannot be put back into service?

R. [DOE-ORP] DOE-ORP has not selected another primary tank but there are known alternative tanks. The tanks in the AP Tank Farm are a reliable source for the WTP.

Agency Presentation

Tank AY-101 Update

Chris Kemp provided TWC members with a brief presentation³ on tank AY-101, a DST located next to tank AY-102. A routine check of tank AY-101’s annulus ventilation system indicated higher than normal radiation levels. Filter paper was collected from tank AY-101 that was in the tank from March 16, 2016 – April 1, 2016 was analyzed. Results indicate that cesium-137 was present by a few hundred counts greater

Attachment 3: AY-102 Retrieval Update

than normal. DOE-ORP performed an inspection of all eight risers within tank AY-101 and observed no visual changes, compared to the visual inspections performed in 2012, 2013, and 2014. DOE-ORP is currently determining potential causes of the higher than normal readings. There is speculation that cross-contamination between the ventilation system of the annulus and the primary tank's ventilation system may have occurred.

Committee Questions and Responses²

Note: This section reflects individual questions, comments, and agency responses, as well as a synthesis where there were similar questions or comments.

Q. Is there reason for the public to be concerned?

R. [Ecology] There doesn't appear to be an immediate risk to the public. If the liquid waste were to leak through the tank, that would generate a greater concern to the public.

Agency Presentation

Retrieval Technologies and Regulatory Requirements for Hanford Tanks

Chris Kemp provided TWC members with an overview of the technologies used for waste retrieval from tanks, as well as the closure process. Chris mentioned that his presentation aimed to address several questions that the TWC had requested of ORP on an earlier planning call. Key points from his presentation⁴ include:

- There are 177 underground storage tanks located at the Hanford Site. 149 are single-shell tanks (SSTs) and 28 are double-shell tanks (DSTs). These tanks combined hold 56 million gallons of radioactive and chemical waste.
- Approximately 2.4 million gallons of tank waste has been retrieved. 1.35 million gallons of waste has been retrieved from the C Tank Farm, while nearly 1 million gallons of waste has been retrieved from the S Tank Farm (tanks S-112 and S-102).
- DOE-ORP has most recently been focused on tank waste retrieval from the C and AX Tank Farms. Significant construction has occurred in both of these Tank Farms to install waste retrieval systems.
- To date, 15 tanks have been retrieved. Also, tank C-111 is currently under review, for which DOE-ORP is planning to submit a retrieval certification, as per a requirement of the Consent Decree, to the Department of Ecology.

Attachment 2: Transcribed Flipchart Notes

Attachment 4: Retrieval Technologies and Regulatory Requirements for Hanford Tanks

- Currently, tank AY-102 is undergoing retrieval, retrieval is ongoing at C-102, and four AX tanks have construction and placement of equipment in preparation for retrieval.
- Several technologies and tools may be employed on a single tank in order to retrieve waste. The current retrieval methodologies include:
 - Acid dissolution
 - DOE-ORP will not employ the caustic acid method again as the use of this chemical has the potential to form oxalates downstream at the WTP.
 - Modified sluicing
 - This is a method where supernatant is pumped into the tank and sprayed 150 gallons/minute to mobilize tank waste to the center pump. The equipment used to do modified sluicing has changed from dome-mounted sluicers to enhanced-reach sluicer has changed during the C-Farm retrievals
 - Modified sluicing is the preferred waste retrieval method.
 - Tool: Mobile arm retrieval system - sluicing (MARS-S) which requires cutting a 54-inch hole in the tank dome. MARS-S was used at C-107.
 - Utilized to cut into large domes in order to perform sluicing activities.
 - Vacuum retrieval
 - Utilized to retrieve waste in from tanks C-201 to C-204 in 2005-2007. Vacuum in the C-200's was a mechanical vacuum and the vacuum in tank C-105 is an educator based vacuum. Any vacuum retrieval method has a lesser retrieval efficiency than sluicing, so unless a tank is a leaker or has suspect integrity, sluicing is our main tool.
 - Saltcake/chemical dissolution
 - Utilized to retrieve waste at tanks S-102 and S-112 and will be used at A/AX Farm.
 - High-pressure water
 - Utilized to retrieve hardened waste that is generally similar to boehmite or gibbsite which are mineral forms of aluminum hydroxides in order to perform retrieval processes of hard-to-retrieve wastes.
- Lights and cameras are used to monitor the waste retrieval processes and require frequent change out due to radiation fields within the tanks being retrieved.

- Groundwater and vadose zone computer models are used to evaluate the level of protection offered by the actions taken at Hanford. The models estimate contaminant levels in the vadose zone and groundwater over the next 10,000 years.
- Evaluations are performed for residual waste located inside the tanks to determine if the remaining waste is low-level waste or will require additional retrieval methodologies.
- The retrieval technologies are not industry-standard and many are custom fabricated. The cost of the retrieval equipment ranges from \$650,000 - \$1,000,000 for sluicers. Sluicing the waste in the tanks is a more cost-effective method than utilizing a mechanical tool.
- DOE-ORP is in the process of acquiring a Tank Waste Retrieval Work Plan approval from Ecology to employ a third retrieval technology at C-105.
- The regulatory goal for tank retrieval is less than 360 ft³ of waste remaining in a tank and the limit of the retrieval technology. If two retrieval technologies are deployed to their limit and greater than 360 ft³ waste remains, DOE can deploy a third retrieval technology aiming to meet the regulatory goal, or request to forego a third retrieval technology with approval from Ecology.
- The C Tank Farm includes approximately 100,000 gallons of waste that has leaked into the surrounding soil over time from various sources. A performance assessment of the C Tank Farm tanks, ancillary equipment, and contaminated soils is currently being developed and will be released as draft in the fall of 2016.
- DOE-ORP has submitted the TPA Action Plan, Appendix I, Tier-1 closure plan to Ecology for tanks located in the Hanford Site and is preparing a Tier II closure plan for the Waste Management Area-C Tank Farm. The agencies are working together to determine an agreed pathway for tank closure. The milestone to complete the cleanup of the Waste Management Area-C is currently set for June 2019. Chris noted that this milestone is anticipated to be missed and the re-negotiation for the milestone (M-045-83) is ongoing.
- There are risks associated with the radioactive and chemical wastes located at various tank farms at the Hanford Site that need to be addressed including:
 - Maintaining worker safety
 - Safety to the public, and
 - Groundwater impacts due to mobile long-lived radionuclides and chemicals. Some of the impacts to groundwater are occurring now and others are modeled for 10,000 years.

Agency Perspective

Jim Alzheimer, Ecology, provided TWC members with a brief presentation on the tank closure process for SSTs, from the perspective of Ecology. Key points from his presentation⁵ include:

- The components necessary to close a SST system include completed tank waste retrieval, a Tier 3 closure plan, closure of all other Waste Management Area (WMA) components, mitigation of vadose zone and groundwater contamination, and coordination with other WMAs and closure sites.
- The most current analysis results for C-Farm indicate the risk to the groundwater for future releases from the grouted tanks will be less than the risk of contamination already in the vadose zone.
- Performance standards for the closure of any one SST is part of the closure process for the entire SST system. The components of the SST system include all SSTs, ancillary equipment, pipelines, catch tanks, and contamination in the vadose zone and groundwater.
- Current retrieval technologies to reach the regulatory goal of less than 360 ft³ of waste left in a SST are not always met. However, technologies appear to be capable to remove enough waste to provide adequate protection of human health and the environment for the tanks retrieved to date.
- There are several tanks yet to be retrieved that may not be adequately retrieved with the current technology, due to tank conditions and waste properties.
- The current retrieval rate is less than the projected rate necessary in order to meet TPA milestones.
- After the ten tanks from the A/AX Tank Farms are retrieved, the DST system will not have the capacity to accept waste for any more tanks, even with the optimal use of the evaporator.
- DOE-ORP and WRPS continue to make progress on SST retrievals despite a limited budget or emergency activities that can cause time constraints. The lessons learned from past tank waste retrieval will be applied to the tanks located at the A/AX Tank Farms.
- Ecology is interested in the perspectives of HAB members and the public on the processes involving tank waste retrieval and the closure of tank farms.

Attachment 2: Transcribed Flipchart Notes

Committee Questions and Responses²

Note: This section reflects individual questions, comments, and agency responses, as well as a synthesis where there were similar questions or comments.

Q. Are the waste retrieval tools considered contaminated?

R. [DOE-ORP] New tools are purchased for each tank retrieval. When tank retrieval equipment fails the tool are removed from a tank as radiological equipment, double-draped, treated and disposed. When removing tools from a tank, the tool is double-draped and often prepared for disposal at the Environmental Restoration Disposal Facility (ERDF).

Q. The standard of leaving less than 360 ft³ of waste inside a tank dates back to the 1980s, when the TPA was first negotiated and the EPA allowed 1% of the waste to be left in the tank and labeled as “empty”. Criteria such as this can create issues about the determination of the waste left inside the tanks and what becomes of the waste overtime. Appendix I pertains to the risk that remains in order for tanks no longer in active service to achieve closure status. The regulations for cleaning up the 1% of the waste in retrieved tanks remains an issue. Where does Ecology stand in the DOE 435-1 process and when will parties involved in the regulation be notified?

R. [DOE-ORP] The latest status update on the performance assessment occurred in the fall of 2015. There have been two decisions completed for 435-1, done at West Valley Demonstration Project.

Q. What are the cumulative impacts of leaving waste in the tanks at the C Tank Farm and the soil at the surrounding sites?

R. [DOE-ORP] Currently, the best tool to evaluate what the cumulative impacts are is the Tank Closure and Waste Management Environmental Impact Statement.

Q. Is the frequency of groundwater sampling increased during the retrieval process?

R. [DOE-ORP] Groundwater samples were performed during active retrieval at the C Tank Farm. Sampling is performed quarterly for active tank farm sites around the perimeter of the tank farm. There are not groundwater wells within the Tank Farm itself as a protective measure to groundwater. Information on the frequency of groundwater sampling increases during the retrieval process will need to be gathered and provided in follow-up to this discussion.

Q. What is the life cycle expectancy of the transfer lines in place and what detection systems are in place?

R. [DOE-ORP] The retrieval lines have a ten-year shelf life and a three-year service life. . Leak detection currently occurs at the low points of the transfer line. DOE-ORP may evaluate a new transfer line detection system.

Attachment 5: Single-Shell Tank Closure Ecology Perspective

Q. When will grouting the empty tanks occur?

R. [DOE-ORP] DOE-ORP needs to have an approved closure plan from Ecology and DOE HQ in order to begin grouting the empty tanks. The anticipated date for the closure plan is under discussion.

Q. There are increased liquids when the method of sluicing is applied for tank waste retrieval. Has DOE-ORP examined the integrity at the C Tank Farm?

R. [DOE-ORP] There is no annular space in the tanks at the C Tank Farm. The tanks before retrieval all go through an integrity review to see if sluicing is a possibility.

Q. Are there known leaking tanks located at the C Tank Farm?

R. [DOE-ORP] There are three tanks at the C Tank Farm with potential issues near the tops of the domes. Tank C-105 is also questionable, as well as one dry well on the southeast corner of the farm that has an anomalous indication of a past operational leak.

C. The process of closure of a tank farm is concerning with leaving waste on the Hanford Site for an unknown length of time. The process of closure of the C Tank Farm sets a precedent and determines the closure of other sites. It is concerning to have unknowns about WIPP and how long the Hanford Site will have to store TRU waste before it is sent to WIPP.

R. [DOE-ORP] The baseline closure is outlined in the Tank Farm Closure Environmental Impact Statement. The retrieval process is progressing slower than planned. The WIPP schedule does not impede the process of retrieving waste from tanks. As DOE-ORP and the HAB work through the upcoming FY work plan topics, an idea would be to write a white paper in order to give a different perspective to DOE-ORP about the closure process of tanks.

C. The acceptance criteria of leaving less than 360 ft³ of waste within a tank is concerning. It is still radioactive waste left on the Hanford Site. DOE-ORP should be considering what measures can be taken to achieve complete cleanup, including soil and deep vadose zone contamination.

R. [DOE-ORP] There are trade-offs involved with the closure of tanks. How will the mission be fulfilled if every tank has to have 100% waste retrieval? These kinds of viewpoints from the HAB are important for DOE-ORP to hear and understand.

C. With the recent news coverage on tanks AY-101 and AY-102, there has been criticism about the comprehensive analysis performed on DSTs. The TWC has been briefed on this analysis in the past and it is important for the public and for new Board members to know that these data exist.

R. [DOE-ORP] Independent Qualified Registered Professional Engineers (IQRPE) completed the comprehensive tank integrity program. The expert panel to inspect tanks AY-101 and AY-102 has been increased.

C. Secondary tanks will remain in question because there is no ability to assess the quality of the bottom portion of secondary tanks. While there is fair confidence on the knowledge of DSTs, there are eight DSTs that are of particular concern and more information needs to be provided before the agencies and the Board can move forward.

R. There are still many risks to be evaluated: tank waste, the environment, and human health. The HAB can provide advice on how to change the existing laws and regulations.

C. To eventually complete tank waste retrieval is exciting. People who are not workers on-site have difficulty grasping how large of a job tank waste retrieval is. It is an amazing feat what the workers have been able to accomplish.

TWC members thanked Chris, Jim, and Joni for their presentations and comments. Issue managers will work together in FY 2017 on a white paper that outlines the perspectives on various closure methods for the Hanford tank farms.

Committee Business

TWC 3-Month Work Plan²⁶

The TWC will tentatively hold a half-day meeting on May 11, 2016 to discuss comments received on the white papers regarding cesium management and the WTP communications approach that were introduced at the April 2016 Board meeting, in preparation for adoption at the June 2016 Board meeting. If changes occur with tanks AY-101 and AY-102, the TWC would like to receive a brief status update from DOE-ORP. In addition, TWC members are interested in receiving a debrief of the work plan that was discussed at the Leadership Workshop. The TWC will try to conduct this meeting electronically, with local members meeting in-person.

The TWC will plan to hold a committee meeting in June 2016 that will tentatively include the following topics:

- Debrief on the process of writing white papers
- Debrief of the Consent Decree
- Status update on tanks AY-101 and AY-102

In August 2016, the TWC will tentatively meet to discuss an update on the WTP technical issue resolution.

Attachment 2: Transcribed Flipchart Notes

Attachment 6: TWC 3-Month Work Plan

Attachments

Attachment 1: Effluent Management Facility Overview

Attachment 2: Transcribed Flipchart Notes

Attachment 3: AY-102 Retrieval Update

Attachment 4: Retrieval Technologies and Regulatory Requirements for Hanford Tanks

Attachment 5: Single-Shell Tank Closure Ecology Perspective

Attachment 6: TWC 3-Month Work Plan

Attendees

Board members and alternates:

David Bernhard (phone)	Becky Holland	Melanie Meyers
Shelley Cimon	Steve Hudson	Jerry Peltier
Dirk Dunning (phone)	Pam Larsen	Bob Suyama
		Helen Wheatley (phone)

Others:

Dieter Bohrmann, North Wind/DOE-ORP	Jim Alzheimer, Ecology	Roger Landon, BNI
Reggie Eakins, DOE-ORP	Steve Lowe, Ecology	Todd Nelson, BNI (phone)
Joanne Grindstaff, DOE-ORP	Dan McDonald, Ecology	Bruce Schappell, BNI
Chris Kemp, DOE-ORP	Ginger Wireman, Ecology	Patrick Mills, CTUIR
Daniel Kovis, DOE-ORP	Robin Varljen, Ecology	Alex Nazarali, CTUIR
Carrie Meyer, DOE-ORP		Samantha Herman, EnviroIssues
Jeff Rambo, DOE-ORP		Ryan Orth, EnviroIssues
Jason Young, DOE-ORP		Michael Turner, MSA (phone)
		Shintaro Ito, PNNL
		Mark Triplet, PNNL
		Rod Skeen, PNNL
		Kelsey Shank, SN3
		Annette Cary, Tri-City Herald
		John Britton, WRPS
		Doug Greenwell, WRPS
		Paul Rutland, WRPS
		Katherine Bittinger, WSU