

FINAL MEETING SUMMARY

**HANFORD ADVISORY BOARD
TANK WASTE COMMITTEE MEETING**

*April 17, 2012
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 & Introductions

Dirk Dunning, Tank Waste Committee (TWC) chair welcomed the committee and introductions were made. Dirk then reviewed the meeting agenda.

Discussion of Tank-Related Permit Units

Issue Manager introduction

Liz Mattson, Issue Manager (IM) for the Hanford Facility Dangerous Waste Permit (Permit), introduced the discussion of Permit units that relate to tanks. Liz said the Permit was last available for review in 1994. There have been revisions to parts of the Permit that have been available for public comment since that time, but this is the first time the entire 14,000 page document will be available for public review.

The comment period will be 153 days. Liz said they are working very closely with the Washington State Department of Ecology (Ecology) to prepare for release of the document. She said the focus of the discussion today would be on those aspects of the Permit that might appeal to TWC. Liz said there will be a public workshop on the Permit on May 3. She thanked Ecology for organizing this workshop for the Hanford Advisory Board (Board or HAB) and preparing the presentation.

Presentation

Suzanne Dahl, Ecology, and Jeff Lyon, Ecology, gave an overview of several Permit units that relate to tank waste (Attachment 1). Suzanne said the purpose of the Permit is to regulate dangerous waste. The Permit follows a series of regulations that are defined in the Dangerous Waste Codes. Each operable unit in the Permit follows a different set of regulations. The Permit unit is written based on all the information given to Ecology by the permittee on how the facility functions according to regulatory requirements. There are Permit conditions and addendums. Suzanne said each unit of the Permit does contain many of the same components, such as an up-front fact sheet, statement of basis, unit description, detailed operating and process information, and permit conditions. Suzanne and Jeff provided several fact sheets for different Permit units.

Suzanne said the Permit is constantly changing, which is especially true for the Waste Treatment Plant (WTP). Different units are added to the Permit and others are removed as they close. Modifications to the Permit are available for public comment when new units are added.

Suzanne and Jeff highlighted the following operable units in the Permit:

- Double-Shell Tank System and 204-AR Waste Unloading Facility (Operating Unit #12) (Attachment 2)
- Single-Shell Tank System (Closing Unit #4) (Attachment 3)
 - Many of the single-shell tanks (SSTs) on the Hanford Site have leaked or overflowed, contaminating the soil beneath. SSTs are considered unfit for use. Most of the liquid has been removed from the SSTs so that the remaining material is largely sludge. There is a plan to remove all waste over the next 31 years. The Permit unit defines a closure plan and outlines monitoring requirements.
- 242-A Evaporator (Operating Unit #4) (Attachment 4)
 - Jeff noted that the Permit does not include discussions about how often the evaporator should run and other operation considerations. The Permit only describes the conditions.
- Waste Treatment and Immobilization Plant (vit plant) (Operating Unit #10) (Attachment 5)
 - The WTP is a somewhat odd permit in that it is almost constantly being modified. Currently, the WTP is mostly a construction permit and does not include operating conditions. Since WTP is under a design-build contract, the Permit needs to be issued as design is still being completed. Each construction component needs to be permitted

before any actions take place. Changes to the design that the public has not seen will lead to permit modifications that the public can comment on, while updates to existing design will not be available for public comment.

- WTP is regulated as a miscellaneous unit, meaning Ecology can use various regulations to cover all potential components of concern. There is a risk assessment for WTP that considers air emissions and many other constituents. Ecology is concerned with the types of control systems that would be needed to be protective. The risk assessment will be used to establish initial operating conditions.
 - Once WTP begins operation there will be “trial burns” that will consider different production levels using a simulant to determine how all the components operate.
 - Ecology recognized they would need to modify the Permit several times for WTP while the Permit is out for public comment and were concerned about how to manage the process. WTP was split from the larger Permit so modifications could be made to different parts of the Permit. There will likely be several more modifications before the revised WTP Permit is re-incorporated into the larger Permit.
- Liquid Effluent Retention Facility/Effluent Treatment Facility (Operating Unit #3) (Attachment 6)
 - This facility receives effluent such as leachate from various sources. Additionally, groundwater treatment is sent to the Liquid Effluent Retention Facility/Effluent Treatment Facilities. These facilities must have capacity for the volume of waste and ability to process the type of waste. These facilities do not currently have the ability to handle secondary waste from WTP; this will require a future Permit modification. The draft Environmental Impact Statement (EIS) illustrated that secondary waste will have a significant environmental impact if it is not put into another form.

Committee discussion

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 a condition in the SST Permit that deals with how liquids are transferred to the double-shell tank (DST) system?

R: There are conditions for that. We have retrieval requirements in place for the SSTs. The Permit also contains requirements for both DST and SST hose-in-hose transfer line requirements.

Q: What does Ecology see as the difference between the Tri-Party Agreement (TPA) milestones and the Permit? What benefit exists between the milestones and the Permit?

R: There are a lot of aspects of the Hanford Site cleanup not covered in the TPA. There are milestones and primary documents written on aspects such as leak detection, but there is not an

understanding for the administrative code regulations. Ecology would like to ensure their authority of dangerous wastes is understood and administered appropriately. Part of Ecology's task is to manage the closure process in a way that is consistent with state regulations. The TPA does cover a lot of material so milestones are referenced in the Permit.

C: The SST Permit is not being released with the other permits. There should be a public face-to-face meeting in June, instead of only holding a webinar.

R: Ecology is always interested in offering those types of meetings. There could be a face-to-face meeting that is also broadcast through a webinar for those unable to attend in-person.

C: The DST and 204-AR Waste Unloading Facility (204-AR) handout states that DSTs can receive and hold waste, but they will not be used until 204-AR is compliant with regulations. People have stated 204-AR will be knocked down and now workers are being sent into the facility to sample tanks. Is the facility going to be re-permitted and used again?

R: Ecology has not heard anything to that effect. DOE's mission does change and some facilities are retained just in case they might be useful in the future, which is a good decision. However, leaving a facility standing for 50 years to never be used again is not a good decision. Demolition has costs and maintenance has costs as well. We do the best we can within the regulations. If DOE is going to use 204-AR again, it must be re-permitted.

Q: Would the Permit need to be modified every time a line is moved around the SSTs?

R: Ecology talked about that yesterday. We have a hose-in-hose management plan that will be maintained in two tables: old piping that needs to be removed and another configuration including where pipes are connected and where they are going. The plan includes provisions for reconnecting and disconnecting lines. Modifications to the permit are unnecessary if the pipe is included in the table.

Q: Does the Permit cover how to clean up spills and when to contact Ecology about a spill?

R: Leak detection is included in the Permit. There will also probably be a response plan in Ecology's conditions.

C: 204-AR handles many other items besides the DST Permit. How will you integrate other actions? My understanding is that the DST systems feeds 204-AR and that DOE has a very rigid process for receiving material from DST, both chemically and radiologically.

R: Historically 204-AR may have received waste other than from the DSTs, but currently only material from DST enters 204-AR. The waste acceptance criteria is very specific and rigid.

C: The transfer lines have a rigid life and there is a rigid replacement process. Plastics always carry the question of how the material will respond to specific types of waste. Plastic can only withstand a certain amount of radiological exposure.

Q: How would someone from the public comment on the current version of the WTP aspect of the Permit?

R: There was a recent public comment period that ended in December. The next Permit modification will likely begin in June. There will be notices when the next WTP comment period is starting.

Q: When will the pieces of the Permit come together again?

R: The end of September will begin a 90 day public comment period and then Ecology will incorporate public comments. The Permit will likely be brought back together in December.

Q: Are there any lessons learned from Fukushima that are incorporated in the emergency preparedness or other section of the Permit? There are a number of off-site impacts that can affect on-site operations in addition to any immediate impacts to facilities, such as no longer having access to personnel or a disrupted power supply. How does the Hanford Site deal with these concerns?

R: Those issues are addressed in the emergency response plan. The current emergency response plan for WTP is likely not as thorough as it will be once WTP is operational since the Permit covers mostly construction activities.

C: The other facilities and aspects of the Hanford Site are also broken into a number of internal units. There must be an enormous number of units in the Permit. How many systems are spoken to specifically? Is every tank considered as a separate unit?

R: The various types of mechanical handling systems are each considered under their own units, grouped according to system type.

The purpose of today's discussion topic was to make TWC aware of potential areas of interest within the Permit. At the end of the May 3 workshop, there will be a Board workshop. There is time reserved for the Board to plan potential next steps on the Permit. Advice could be issued in September, although there may be a request to extend the comment period.

Specific questions or comments should be sent to Liz or John Howieson. TWC should identify a point person for the Permit. In order for the Board to develop advice on this large document, we would like more help from additional IMs. There is a placeholder on the May 3 workshop agenda for a member of TWC to speak to some aspect of the Permit that is pertinent to tanks. Board members are also encouraged to attend the public workshops on the Permit that are happening after the May 3 workshop. The local Richland meeting will be held on June 6, the day before the June Board meeting.

Discussion of IDF and Risk Budget Tool

Presentation

Suzanne presented information on the Integrated Disposal Facility (IDF) and risk budget tool. She referred to the handout titled Integrated Disposal Facility (Operating Unit #11) (Attachment 7). Suzanne said the IDF is not an active facility and is not receiving waste. There will be some Permit modifications, such as a change in the groundwater monitoring plan. The DOE Permit was modified several years ago in order to alter some aspects in the pre-active state. Fewer resources are being expended, but the area is still being maintained. The Permit only allows for the disposal of low activity glass and there is a limited amount of waste permitted. There are two sides to IDF, including the low level side is not regulated. Either side is completely compliant with the Resource Conservation and Recovery Act (RCRA) or as a dangerous waste landfill. The Permit will be modified in the future to allow for secondary waste from WTP and any other wastes it may receive. The Record of Decision (ROD) was written in 1994, but there have been several supplements to keep it current. There was no information on waste other than low activity glass. In order to allow any waste to be sent to IDF there needs to be a final EIS. The current Permit only includes waste streams that are listed. Suzanne reviewed aspects of the IDF permit she thought might be interesting to TWC as listed on the back of the handout, such as information on potential leakage, how to prevent leakage and groundwater monitoring.

Suzanne said she wanted to specifically address the risk budget tool. Ecology wanted to have information for specific waste forms, but the only forms being considered were glass. DOE did not want to commit to making the specific type of glass outlined in the EIS and the agency wanted to be able to use different formulas for glass. Ecology wanted to be able to attach specific values to glass to ensure all glass meets the requirements. DOE will update that information during operations. Different types of glass perform differently, although all types do perform relatively well. The information on different types of glass can be entered into the risk budget tool. In order to add those to the Permit, an EIS will have to be completed and will have to have an integrated waste technical review document to examine secondary waste. The risk budget tool was developed to consider newly treated waste. Groundwater and the environment are not allowed to be impacted in any way by landfills, but the problem becomes how to examine the overall waste volume going to IDF. What will the acceptance criteria be for the various kinds of secondary waste that will be disposed over the next 40 years? IDF has not specified what type of waste should be made in order to be disposed of at the facility so that is where Ecology stepped in. DOE and Ecology eventually developed the idea of using a risk budget tool. The risk budget tool uses some sort of modeling event. It is an ongoing and iterative modeling process using the types of waste forms projected to be sent to the landfill. The characteristics are modeled to determine which is most likely to create a problem. Suzanne said the integrated waste technical review document defines the basic waste streams and their attributes and the risk budget tools is a modeling exercise that assesses the cumulative effects of all waste streams. The risk budget tool allows a way of establishing our own waste acceptance criteria through a modeling effort.

Committee Discussion

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

C: The modeling is helpful in identifying contaminants, but how are engineers that have to approve the criteria able to validate the models?

R: There are very few models that have full approval. The IDF had been designed and built to specific regulations. The tertiary system is an overdesign of regulations. Liners during operations protect the groundwater and environment. A cap provides protection after operations. Landfills that contain materials that persist beyond the life expectancy of the cap might need additional protections.

Q: You said that waste had to be in such a form that it could not impact the groundwater?

R: That is what the regulations require. At the Hanford Site, we deal with this a little differentially because the metals and radionuclides last so long. Through the entire Hanford Site and all the waste streams, we are likely going to have some impact on groundwater. We are trying to minimize the risks to significantly below drinking water standards or health based standards. The goal is for zero impact to groundwater, but the permit does include some flexibility that allows impacts below health based standards.

C: DOE-Office of River Protection (ORP) has gone through a development program examining particular waste forms out of WTP. None of these have been glass. The person conducting the testing concluded that the waste forms passed their tests. There is some concern that DOE-ORP is saying they are developing these waste forms, but the numbers are suggesting they will not meet criteria.

R: We do not know if that is good enough until the waste form has gone through the risk budget tool; that will give us specific numbers. These numbers have to meet the criteria to be protective of groundwater. We know from the draft EIS that there will be an environmental impact from regular grout. Ecology will not allow disposal of any waste forms until they are mitigated appropriately.

C: Several years ago contractors under DOE talked about waste forms, but unfortunately the entire process involved people discussing the minimum standards necessary for an acceptable waste form design. This is working backwards from the waste form standards. The question should be focused on creating a waste form with the least impact.

Q: Is there a way for Ecology to prevent other waste forms from being permitted?

R: Ecology does that right now. We are asking for the IDF landfill as well as the mixed waste landfills to maintain permit conditions that specifically identify the types of waste streams that can go there. It is easier to determine allowable waste streams than waste streams that are not allowable. We have not identified every waste form, but we can proactively say these are the wastes that are permitted.

Q: DOE would be developing the risk budget tool. Are there parameters to ensure conditions are acceptable to Ecology?

R: Permit conditions do allow for our input and review for the risk budget tool and the assessments that feed the risk budget tool. Ecology will be very interested in making sure the risk budget tool has a natural progression from the modeling to the EIS. Ecology spent eight years being involved in the EIS and the modeling used. We have great faith in that modeling and believe it can be the basis for future modeling at the Hanford Site. We want to ensure the EIS modeling is the basis for risk budget modeling at IDF.

Q: Where will the enforcement be? Can Ecology reject the proposed risk budget tool if you do not believe the parameters?

R: We would be looking at the parameters as we've done with the EIS. We would run the EIS and risk budget tool on some parameters, especially if there are some that Ecology and DOE cannot agree on.

C: Agencies should be very careful when using modeling. Subsurface Transport over Multiple Phases (STOMP) has been the best used on site so far and has been further calibrated to more accurately reflect reality. However, no model exists that is validated for what is occurring in the subsurface. Conceptually, we know the model is wrong. There are major components being missed. For example, at RCRA sites across the country plastic liners are far more durable than expected. The cap might fail before the liner, leading to a bathtub situation similar to what occurred at Love Canal. The models do not address this issue and it should be included as a sensitivity case.

R: Ecology has been concerned with these types of issues for a long time.

C: There are separate authorities and responsibilities for the different types of waste forms.

R: The IDF Permit is written fairly broadly to include all constituents of concern. Before we do any Permit modifications on the solid waste forms, we want to understand that waste form and how it fits into the risk budget tool. We also want to understand if the design is being implemented to develop an appropriate waste form or if there are additional modifications needed. If some of that information is missing, Ecology would require more information before making any modifications.

Q: The Tank Closure EIS is supposed to cover additional landfills. Are those going to be RCRA permitted units? Would those fall under the same IDF types of concerns?

R: Landfills would have to be RCRA compliant. In all likelihood, any landfill receiving RCRA waste would have a dangerous waste permit. There would be something similar to the risk budget tool or perhaps the landfill would be covered enough in a National Environmental Policy Act (NEPA) or State Environmental Policy Act (SEPA) document.

C: Waste is required to demonstrate specific performance in the risk budget tool. There are several ways of accomplishing that. Unless you specify the procedures and ensure those procedures are being followed, it is possible to deviate from approved procedures to obtain any number.

R: The Permit conditions do not go into that level of detail. A public comment reflecting that concern would be very helpful.

C: TWC has expressed the concern over DOE exploring non-glass secondary waste. More money, time and effort are being spent on things that have already been researched and decisions that have already been made.

R: The Tank Closure & Waste Management EIS does not support the use of anything other than glass for primary waste streams from the data or the interpretation. There has been a commitment to vitrification since 1993 or before by DOE to the citizens of Washington State. For a short period of time between 2002-2006, DOE asked Ecology to consider other waste forms if they were faster, cheaper, and as effective as glass. No other treatments perform as well as glass. DOE also committed to having a facility operational by 2022 in order to treat all waste by 2047. Ecology stands behind the EIS and had a great relationship with DOE in developing the document. Ecology will fight any waste form other than glass and believes that if 90% of waste is going to be left in near-surface burial in Washington State, it should not be in any form other than glass. Vitrification is the only acceptable waste form for Ecology.

C: The Nuclear Regulatory Commission (NRC) classified the Hanford Site with vitrification. Any change from vitrification would require re-classification under the NRC. The original laws specified glass as the waste form.

C: I can support advice on the risk budget tool, but cannot support advice that goes against the TPA. The TPA requires DOE to follow certain procedures, such as going through a down-select. The advice would fly in the face of the TPA.

R: Ecology has one interpretation of what is in the settlement agreement and DOE has a different interpretation. Ecology believes the down-select is a down-select of different types of vitrification and was never meant to include other waste forms. DOE understands that differently, which is why they are considering steam reforming and grout as additional waste form options. The advice would be against one agency's interpretation of the TPA.

Comments on the IDF would be incorporated into the Board's Permit comments so the advice is not divided into too many pieces. It might also be possible to have separate comments on IDF. Some advice points could be on Permit conditions for the risk budget tool or how to use diffusivity calculations. Advice should come forward in September either as part of the Permit advice or as separate advice. A decision will be made on whether to separate the advice at the May 3 workshop.

Dirk is the IM for this piece of the Permit. Specific questions should be sent to Dirk, who will forward them to Liz. The committee will need to begin framing advice in June in order to have it fold in with the other Permit comments to be sent to the Board for approval in September.

The committee requested hearing perspectives from both Ecology and DOE on their interpretation of the TPA that would either allow or not allow waste forms other than glass.

Interim Hanford Storage Flyover Presentation

Agency presentation

Janet Diediker, DOE-ORP, introduced Curt Roeck as the Washington River Protection Solutions (WRPS) project manager responsible for the interim storage facility. She said Mike Connelly, WRPS, is the engineer responsible for the flyover presentation.

Mike went through the flyover presentation of the interim storage facility. He said the proposed facility is an open rack vault system. Mike reviewed the path a cask would take from entering the facility to storage. There is an administration block that contains control room offices and storage as well as a crane maintenance area. Casks are loaded into the facility in the import bay. Vaults are configured in a dual vault setup that allows complete redundancy for throughput. Each vault consists of 2,000 canisters. There is a cooling system to maintain waste in a compliant form. The facility will have on-site transport systems that interfaces with high-level waste handling. Single canisters will be loaded at WTP and brought to the interim storage facility where the transporter will be secured. A 60 ton overhead crane will remove the cask and place it in transfer tunnel. The loaded cask weighs about 45 tons. Mike said once the cask is removed from the transport, personnel enter through an access door and add an adaptor to the top of the canister. The adaptor allows the cask to be opened.

As the cask moves further into the transfer tunnel, the in-cell crane will remove the cask lid and canister so it can be placed in the vault. The canister is opened remotely by a crane operator. The cask is then transported down the central aisle to its final position.

Mike reviewed a few additional features of the interim storage facility. He said as long as there are canisters in the vault, there will never be humans in the vault. Cranes can be pulled out of the area for maintenance. Largely, crane maintenance will be for load testing and standard maintenance. The additional service crane is a safety feature that allows removal of the lower cranes. There is a buffer between the controlled access and administration area.

The interim storage facility is able to store 4,000 casks. It is also expandable. The 4,000 canister capacity allows time to make a decision if off-site shipping becomes possible or there is a need to expand. The transport tunnel that runs in front of the vault can be extended and add to vault capacity in any increment once needs are determined. The transport tunnel can also be converted to shipping.

Committee discussion

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

C: It does not look like there is redundant cooling.

R: There is one loop for each system. We found that with the heat load on the vault we may be able to maintain the canisters below line temperatures without additional features. The decay heat on the canisters is not creating high heat loads in the vault. In the event of a cooling system loss with worst case scenario of a complete ventilation system loss, we would have 12 weeks to bring systems back online before experiencing extremely elevated temperatures.

Q: If you added an off-site transport facility, would you put the heavier cast on that tunnel and load below the port to try to avoid too much additional movement?

R: There are no requirements for off-site shipping. We have developed some scenarios where the shipping order would be in reverse order of how casks were loaded into the facility.

Q: Can you talk more about the buffer area?

R: The buffer area is radiological. There is very little contamination under normal operating scenarios.

Q: What kind of security clearance do you foresee for people working in the facility?

R: There won't be any security clearance. The only requirements will be proper asset protection.

Q: Will the facility be located between WTP and the tank farms?

R: The facility is directly north and downhill of WTP. It is next door to ETF.

C: The waste will be transported from high level so if the casks are designed really well there will not be a radiation issue with transport.

R: Correct. The shielding is going to be above and beyond normal requirements.

Q: Will the design of WTP change to accommodate the casks?

R: We had an interface agreement with WTP where we provided the concept to them several years ago. We gave them the guidelines and our facility can easily meet WTP requirements.

Q: Has the transport device been designed?

R: No. That is still conceptual. The concept is based on vertical orientation. We are determining the stabilization of those configurations and whether they can be laid down.

Q: What kind of radiation fields will be in the facility?

R: It is a given that there will be high level radiation inside the vault. We will meet the annual occupation limits on the surface of the vault exterior.

C: The larger concern is for all the internal components such as the electrical wiring.

R: That is why we have the staging area to pull the crane and other components into the standby area.

Q: What is the life span of a crane?

R: Cranes are expected to last 50 years.

Q: If a crane needs to be pulled back, would it need to be decontaminated to use?

R: It would not need to be decontaminated under normal circumstances.

C: A larger concern would be if a cask drops and pulverizes the glass.

R: The facility is designed to preclude a drop larger than seven meters, which is in a safe range. We are also considering seismic design.

Q: Have you calculated the radiant heat loads on the concrete?

R: We have not done that calculation yet, but we are not overly concerned about temperature.

Q: Are there impact limits at the bottom of the tubes?

R: We do not need impact limits based on testing at this point. If we determine there is an accident scenario we will determine impact limits.

Q: Are canisters going to be double stacked?

R: The Racks will go to the center of gravity on the top canisters. There are trade-offs for making the racks stable for seismic events while not being too tall.

Q: Has there been any consideration for wildlife?

R: The high radiation vault has one entry point deep in the facility. The doors will be secure. We will be considering that question further.

Q: How do you monitor the space?

R: There are crane mounted cameras temporarily stationed in the high radiation area. We have visual recognition of those cameras for the rack location. We are able to locate waste at any given time.

Q: Will the operation be done by sight or is it mechanically controlled?

R: The placement of canisters will be through sequence control through visual camera location. Due to the length of the vault, manual operation of the cranes would be fairly difficult.

Q: What types of upgrades will be needed for the rail spur if waste is going to be shipped by rail?

R: Rail was chosen as an option for one off-site transport method. The other option is the road. There are many considerations that would be necessary if off-site shipment becomes an option.

Q: When do you anticipate having the interim storage facility completed?

R: It is scheduled to be operational by September 2018.

C: Part of the rationale for this facility is that it will be incrementally built. 6,000 canisters is the largest output anticipated. There will be a decision point when we must determine the next step. The incremental protocol allows for this type of decision-making.

R: The 6,000 canister capacity should support 10 years of operation.

Q: How long does it take a cask to go through the facility and into position?

R: The cycle time is a little over six hours, which is three casks per day.

The committee did not identify any immediate advice points. Dick Smith will follow the topic as the IM.

Appendix H Discussion

Chris Kemp, DOE-ORP, gave a presentation on tank farm area decision-making (Attachment 8). He reviewed Appendix H – Single shell tank waste retrieval criteria procedure (Attachment 9) and Appendix I – Single-shell tank systems waste retrieval and closure process (Attachment 10).

Committee discussion

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

Q: How many tanks are being retrieved under this process and how many under the consent decree process?

R: The consent decree covers bulk retrieval on tanks C108, C109, and C110. The consent decree covers C Farm plus an additional nine tanks. Other tanks are under Appendix I.

Q: Does the 360 cubic feet cover the heel and anything left in the tanks?

R: We are required to retrieve 360 cubic feet. It covers anything remaining in the bottom of the tanks.

Q: How are tanks pumped? There are instruments and other materials at the bottom of the tanks.

R: For the most part, excess materials are removed prior to retrieval. Retrieval equipment that remains in the tanks is not considered part of the volume. We measure the residual so voids in the pumps are assumed to still contain material. We came to an agreement on how to handle the equipment left in tanks and an agreement on the volume. We are making an assumption since we do not know for sure what the volume is.

Q: What happens when you come across a tank with a large piece of equipment?

R: We will attempt to remove the equipment to aid retrieval. However, some equipment cannot be removed. In these cases, we will not count the equipment for volume measurements.

C: When the TPA was written in 1989, there was an open disagreement that has never been resolved about tank waste residuals. RCRA considered how clean a site could be before it was considered complete. EPA allowed 1% of waste to remain after suction was broken. Ecology wanted the tanks to be as clean as possible. DOE apparently did not want a requirement for the tanks to be entirely clean so that is where the 1% originated. The TPA states the goal is to remove as much waste as possible to get the tanks out of active status. Once waste is removed, tanks enter into closure and post-closure, which is covered in Appendix I. Considerations for clean closure and landfill closure were pushed into the future for resolution.

Q: Do you think we are done with Step 2b in Appendix H?

R: We have made some progress, but have not agreed on the soil column aspect. We are dealing with a completely different situation than in Idaho where the piping is RCRA compliant. Other sites do not have process history. They are in the process of completing those steps.

C: The performance assessment is the tool to figure out future projections in order to make comparisons. Is there a schedule in place for the TPA agencies to work through a performance assessment?

R: An even more relevant consideration is the interaction of the consent decree and how to mold NRC involvement within the consent decree. How do we do a waste incidental to reprocessing? NRC agreed to do that and they have been part of our performance assessment working session. All parties, including the agencies and stakeholders, should collectively work with NRC.

C: Looking at the chart, it appears that whenever the cubic feet requirements are exceeded there needs to be an individual exception for each occurrence. There is not a definition of what an exemption might look like. I assume this graphic mapping includes the stalactites.

R: It includes all residual waste within the dome space. We are currently evaluating what is being included.

C: It would be wise to approach NRC sooner or later for an exemption. I would expect more than 360 cubic feet when analyzing the residual. Alternate criteria acceptance should be considered.

R: That would be a risk-based retrieval. After completing the retrieval, we write a retrieval report.

C: The way we collect samples is to put a camera in one riser and put a sample sleeve in at the bottom. The sample bottle sits at the bottom of the tank and a person sprays the sample from a trailer. For off-riser samplers, there is a car that drives around the bottom of the tank. When the bottle is full enough it is brought up in a glove bag. It would be complicated to sample the walls of the tank. We try to get nine representative samples from the bottom of the tank.

R: It took 18 months to develop the data needed for tanks to conduct a data quality objective. Ecology insisted that DOE take a representative sample from each tank dome. We analyzed for everything that could possibly be in the tank. Many of the materials we look for are not there. We know what is left in every tank when we complete work on the tank. The assumption is that the walls are same, which is not actually the case. Whatever is on the wall should be bounded by the sample. The residuals are worse than what is in the tank. The consent decree is court-ordered so you have to meet 2010 requirements for the purpose of meeting the consent decree. When the consent decree is satisfied, you must meet the TPA. For Ecology, that means you cannot close the system until going through the TPA process. A performance assessment is required.

C: I suggest having alternatives so another measurement or technique can be approved by NRC.

R: Ecology believes the performance assessment needs to be completed first, which involves the NRC. Ecology would like to do a performance assessment on the tank farm. The first performance assessment was on Waste Management Area C. If we exceed the risk we have to go to the NRC, which is why we need a performance assessment. The 360 cubic feet criteria is not based on risk.

Q: What is the status of the performance assessment? Is it still on hold for budget reasons?

R: There are a list of budget priorities discussed between DOE and Ecology. The performance assessment is high up on the list. Hopefully it will begin during the next fiscal budget.

C: When the SST permit is issued it will not include closure plans, it will have operating conditions. Will there be anything here that references closing for the Permit?

R: The Permit references Appendix I. It states that DOE will conduct a performance assessment for each waste management area. If waste is left in place the performance assessment will become a risk assessment.

The committee decided there were not any specific action items out of this for today, but there are pieces for future discussions.

Plutonium Particles Discussion

Issue Manager introduction

Dirk, IM for plutonium particles, said a recent report came out about moving plutonium from the Plutonium Finishing Plant (PFP) into the tanks. The size of the particulates could lead to criticality potential within the tanks. TWC requested DOE speak about the plutonium issue.

Presentation

Chris thanked Becky Holland for speaking with him and John Harris, DOE-ORP. He said they went into the SX farms with a number of colleagues and learned that the tank had leaked for a period of time. Chris presented information on plutonium metal and oxide in Waste Management Area C (Attachment 11). He also handed out the executive summary of the Plutonium Oxide Receipts into Hanford Tank Farms (Attachment 12). He said over two million gallons of waste have been retrieved and a great deal of infrastructure has been put into place.

Committee discussion

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

C: One of the concerns about nuclear safety is criticality, which is an uncontrolled nuclear event. If enough fissile material comes together in one place then there can be an uncontrolled nuclear reaction. When you have water or solution in acid, as long as there is less than 450 grams of plutonium it cannot go critical. It also cannot go critical if it is less than five inches. For nuclear safety, it is important to ensure the conditions never exist that could lead to criticality. Plutonium coming on-site from other areas and falling into the right geometry can lead to criticality.

Q: What does all of this mean about operations in the tank farms and all the related work that needs to happen?

R: We know there are two tanks in C Farm that need to be addressed. We will conduct criticality safety evaluation reports. We have concerns over TX farms in the future. We also have concerns about one of the three DSTs in the West Area. 102 will require a criticality safety evaluation. As we begin blending materials for WTP and prepare to move those, we need to evaluate the potential for criticality through a safety evaluation report.

C: Part of these evaluations is to prevent an event from ever happening.

R: There is a lot of conversation that goes into this type of study. The emphasis is on conservatism for criticality safety reports in order to ensure activities are safe as well as plausible.

Q: There are 16 tanks identified for plutonium management. Do none of the other tanks have plutonium?

R: There is plutonium in all the tanks, but it is not all plutonium oxide or plutonium metal. That is what we are most concerned with.

C: In the simplest form, we are concerned about settling and concerned about what will happen when plutonium gets to WTP. We might just need a better blending process to ensure plutonium does not settle.

R: We are modifying mixers and a lot of mixing is occurring. As we move material out of the DSTs, that blending will happen. Mixer pumps will be mixing material before it goes to WTP.

C: Ecology believes the report leads to additional questions: how good is the data, what assumptions were made, what are the cumulative impacts, etc.? Both from the tank farm and WTP side there are many aspects to deal with. There are also questions from a mechanical side and considering the lifecycle perspective. There are important process questions that should be understood so waste can be moved in a safe manner.

Q: How are neutrons monitored in the tank farms?

R: We are not monitoring for neutrons. There were monitors in the 1980s, but we know everything we need to operate safely from a neutron standpoint.

Q: How do you know workers aren't being exposed to neutrons if they are not being monitored?

R: We know there are not neutrons present because there are other elements in the waste that absorb neutrons. We know when neutron emitting material is absent and how much neutron absorbing material is present. We are able to determine the risk. There really is not a need for neutron monitoring. The only concern is when plutonium oxide is present and then we need a thorough understanding of mixer pumps.

C: The first concern is the risk to workers. The second is the C Farm tanks. Third, most tanks are not going to be dealt with for a long time in terms of WTP. We need to consider the issue from a time frame perspective. In 20 years people will be able to do a lot more so we should focus on immediate concerns.

C: Communication should be emphasized more. Workers do not feel their concerns are being addressed. There was a criticality on site back in the 1960's and the official report blamed it on bad communication. The criticality occurred due to making too many runs at one of the waste tanks.

The committee decided to continue following the plutonium issue, but did not identify an immediate need for advice.

Committee Business

The committee updated the six month work plan. Jessica said the May meeting will be a joint meeting between TWC and the Health, Safety and Environmental Protection Committee (HSEP) over two days to develop draft safety culture advice. She said the 15 WTP safety culture framing questions that the issue

team identified would be sent to committee members to help stimulate thinking. TWC decided to further discuss the May agenda with HSEP and continue developing the six month workplan on the upcoming committee call.

Attachments

- Attachment 1: Ecology Presentation on Permit Units Relating to Tank Waste
- Attachment 2: Double-Shell Tank System and 204-AR Waste Unloading Facility (Operating Unit #12)
- Attachment 3: Single-Shell Tank System (Closing Unit #4)
- Attachment 4: 242-A Evaporator (Operating Unit #4)
- Attachment 5: Waste Treatment and Immobilization Plant (vit plan) (Operating Unit #10)
- Attachment 6: Liquid Effluent Retention Facility/Effluent Treatment Facility (Operating Unit #3)
- Attachment 7: Integrated Disposal Facility (Operating Unit #11)
- Attachment 8: Tank Farm Area Decision-Making
- Attachment 9: Appendix H – Single Shell Tank Waste Retrieval Criteria Procedure
- Attachment 10: Appendix I – Single-Shell Tank Systems Waste Retrieval and Closure Process
- Attachment 11: Plutonium Metal and Oxide in Waste Management Area C
- Attachment 12: Executive Summary of the Plutonium Oxide Receipts into Hanford Tank Farms

Attendees

HAB Members and Alternates

Al Boldt	Pam Larsen	Keith Smith
Dirk Dunning	Liz Mattson	Robert Suyama
Rebecca Holland	Sarah McCalmont	Jean Vanni
Harold Heacock	Maynard Plahuta	
Steve Hudson (phone)	Dick Smith	

Others

Janet Diediker, DOE-ORP	Mike Barns, Ecology	Todd Nelson, Bechtel
Joni Grindstaff, DOE-ORP	Robbie Biyani, Ecology	Linda Lehman, CHPRC
John Harris, DOE-ORP	Madeleine Brown, Ecology (phone)	Jennie Seaver, CHPRC
Chris Kemp, DOE-ORP	Dieter Bohrmann, Ecology	Nicole Addington, EnviroIssues
Pamela McCann, DOE-ORP	Erika Holmes, Ecology	Susan Hayman, EnviroIssues
Steve Pfaff, DOE-ORP	Jeff Lyon, Ecology	Jessica Ruehrwein, EnviroIssues

Paul Strider, DOE-ORP	Dan McDonald, Ecology	Steve Baker, INTERA
	Cheryl Whalen, Ecology	Tom Winston, Longenecker & Assoc
	Ginger Wireman, Ecology	Stan Sobczyk, Nez Perce
		Mary Burandt, Public
		Shannon Cram, Public
		Mike Connelly, WRPS
		Curt Roeck, WRPS
		Michael Cloud, WRPS
		Susan Eberlein, WRPS
		Jacob Reynolds, WRPS
		Terry Sams, WRPS
		John Britton, WRPS