

FINAL MEETING SUMMARY

HANFORD ADVISORY BOARD
RIVER AND PLATEAU COMMITTEE MEETING
August 12, 2009
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

Bob Suyama, substituting for Pam Larsen, River and Plateau Committee (RAP) Chair, welcomed the committee, introductions were made and the committee adopted the July meeting summary.

618-10 Status

Chris Smith, Department of Energy – Richland Operations Office (DOE-RL), gave a presentation on the status of 618-10/11 remediation. Chris said the 618-10/11 burial grounds supported work in the 300 Area, and the 300-FF-2 record of decision (ROD) provided the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) decision to remediate the areas. The Tri-Party Agreement (TPA) requires remediation of the burial grounds by 2018. Work currently underway in this area is part of the River Corridor Closure (RCC) contract, but Chris said additional characterization and information on what is contained in the vertical pipe units (VPUs) and caissons is needed before remediation can proceed. He said there is only a radiation absorbed dose (RAD) survey record but no quantitative measure of what was disposed of in the burial grounds.

Chris said 618-10 is located near the main Hanford highway, a publicly accessible road. The distance from 618-10 to the highway is similar to the distance from 618-7 to the road. 618-11 is close to the Columbia Generating Station. Chris reviewed the specifics of the VPUs, which consist of five drums that are each 22 inches in diameter welded together. Each drum is approximately 36 inches tall. He said waste was dropped into this column of drums then stabilized by gravel, grout and a concrete cover. Chris also reviewed the schematic for caissons, which are only at 618-11. The caissons have a chute that extends 15 feet to the top of the caissons, and the caisson itself is 10 feet long. Chris said a flatbed truck disposal mechanism was used to put waste into the pipes.

Chris reviewed the plan for remediating 618-10/11. The previous approach was to remediate both burial grounds simultaneously, but as complexities emerged DOE chose to move away from this approach. He said remediation of these sites is a critical path to completing the RCC project and achieving the 2015 Vision. The interface between 618-11 and the Columbia Generating Station U.S. Nuclear Regulatory Commission (NRC) license created a longer lead time for this site. DOE decided to move forward with 618-10 while working on the issues associated with 618-11. The current approach for these burial grounds is to perform non-intrusive characterization (NIC) on the 618-10 trenches and VPUs, and then begin remediation the 618-10 trenches as this data is obtained. Lessons learned from 618-10 will be used to plan for 618-11. Chris said American Reinvestment and Recovery Act (ARRA) funding will be used to initiate and accelerate this work, with the goal of finishing both burial grounds by 2015.

Chris reviewed the NIC methods that will be used to investigate the sites. Geophysics will locate VPUs using ground penetrating radar (GPR) and electromagnetic imaging. Approximately 400 cone penetrometers (CPTs) will be driven into the ground throughout each site. CPTs have been used successfully in the past to identify dose rate for the trenches, VPUs and caissons, as well as speciation, fuel fragment signature and transuranic (TRU) concentrations of the VPUs. Chris said the biggest issues are spent nuclear fuel and TRU waste, and DOE hopes these NIC methods will resolve these issues. In addition to instrument readings in NIC, Chris said the U.S. Environmental Protection Agency (EPA) requested that soil samples be taken adjacent to or under the structures to determine whether the materials have spread laterally or vertically. Soil samples will be collected at each caisson and approximately 10 percent of the VPUs.

Chris reviewed next steps for 618-10/11 burial ground remediation. NIC will begin in August. DOE has already completed site prep such as grubbing and deployment for geophysical performance, and planning for remediation of trenches is underway. Chris said 618-10 will have the same work controls, approach and coordination as the remediation of 618-7. DOE will also work with Columbia Generating Station and NRC on licensing and safety procedures in order to prepare for work on 618-11. He said DOE-RL has met with NRC, which is supportive of trying to accelerate these remediation efforts.

Chris said characterization will take place at the beginning of September and last until February, so a status update could take place in October on the process and initial characterization at 618-10/11.

Regulator Perspectives

- Les Fort, Washington State Department of Ecology (Ecology), asked whether the fact that 618-11 is inside the perimeter of the generating plant is a consideration. He said being inside the safety zone around that reactor will impact planning and the reasons for de-coupling the sites. Chris said this is being considered. There is a great deal of emergency and security planning for 618-11, with its critical scenario being habitation standards. He said NRC has also expressed concern with how Columbia Generating Station would impact remediation operations.
- Les asked whether historical information from mapping that was completed several years ago, which included mapping the site and its caissons, is being used for 618-11. Chris said DOE has used all of the available historical information. Nelson Little, Washington Closure Hanford (WCH), said the geophysics is based on all of the work that has been done to date.
- Craig Cameron, EPA, said EPA is in favor of more characterization. He said the location of these burial grounds makes worker safety important, and he is glad to hear that DOE is planning for flexibility and adaptation through its characterization approach.

Committee Discussion

- Wade Riggsbee asked what tools DOE plans to use for its geophysical investigation. Nelson said GPR and electromagnetic tools will be used for geophysics. The purpose of these investigations is to locate the center line of the VPUs and determine the number of VPUs and unique pipe units at the site.
- Shelley Cimon asked the difference between VPUs and caissons. Nelson said waste was dropped from a shielded canister into VPUs, which were then filled with grout and concrete to keep the dose rate low. The caisson configuration was determined later, and it has an offset shoot to avoid filling. Nelson said the pipe waste contained in caissons and VPUs is similar.
- Bob asked whether there is a ground-level hazard from the materials due to radiation. Nelson said DOE has completed periodic surveys that did not detect any surface contamination. There is an estimated two to five feet of overburden at the top of the area, with three to five feet to the top of the VPU. Chris said as DOE proceeds with remediation there will be real-time monitoring to measure for any spread of contamination.
- Greg deBruler asked the approximate cost of cleaning the 618-10/11 burial grounds. Chris said the cost ranges from \$110 to \$140 million, but this could change based on the results of characterization efforts. Greg commented that he is glad DOE is giving

accurate numbers for this cleanup. He said when it was first discussed years ago DOE stated the numbers around \$780 million, which was almost the entire one-year Hanford budget. Greg said he is glad DOE has agreed to tackle these waste sites.

- Shelley asked whether the timeline may be extended after DOE meets with NRC. Chris said NRC has been receptive to these efforts and the timeline may be accelerated.
- Dale Engstrom expressed concern that much of the content in the barrels is 300 Area materials that would have to be remote-handled (RH). He said there is a concern that there is nowhere to dispose of the material and no way to retrieve it from the ground. Chris said DOE will not make a decision until characterization data has been gathered and would not make a plan to remove the material without a defined remediation pathway. He said DOE may find through the NIC process that it does not have the resources to remediate.
- Dale asked the method that would be used to disassemble tack-welded five-gallon barrels and safely haul the material. Chris said the first remediation proposal from WCH included a technique that takes over-core that is larger than the VPUs, grout plugs the top, and moves it to the Central Plateau (CP). He said there is concern that there is not a place large enough to handle what would be a 28-foot over-core, even though it would be grouted and stable for transport. He said this proposed option could be validated or something new could be proposed.
- Wade said the data Les mentioned is available, and was shipped to Seattle for storage. He said in the past handling the trenches was going to be a challenge. For VPUs and caissons, DOE looked at injecting grout into the VPUs then cutting the caissons with RH tools to take a smaller section. Chris said a very rigorous value-engineering study evaluated these options, but since DOE does not know the contents, the entire length of the VPUs and caissons would need to be characterized to ensure this is a safe approach.
- Chris said that characterization will take begin in September and is expected to conclude in February. He would be willing to come back to the RAP in October for a status update on the process and how the initial characterization is going.

River Sampling Status

John Sands, DOE-RL, reviewed the river sampling work plan. DOE sampled fish, surface water, shallow/deep core, island soil, shoreline sediment and shallow/deep sediment. He said the study area is from Priest Rapids to the McNary Dam. DOE also took a couple of deeper core samples by Bonneville and above Priest Rapids. A Vibracore was used to obtain deep sediment cores behind the dams. John said a study conducted in the 1970s took cores from behind many of the dams, including Bonneville, which is why DOE re-sampled these areas.

John reviewed groundwater upwelling fieldwork. He said the conceptual model shows contaminants on the surface or directly discharged from the reactors, and DOE wanted to see what is upwelling in the river from the groundwater pathway. A device used for

measuring conductivity in the ocean was used. The tool, a trident probe push pole, was modified, and John said the 400-pound tool worked in all but the heaviest currents. DOE is conducting this work in phases, and started by trying to map the conductivity and temperature profiles before looking for known plumes that go into the river. John said now that DOE knows where these are they will take another segment and conduct characterization of those contaminants. The highest conductivity, or upwell, will then be tested for contaminants.

John said the final sampling activity is fishing, including collecting five types of fish – whitefish, sturgeon, walleye, bass, sucker and carp. He said sturgeon is not studied often, so DOE had a workshop including experts from other agencies to ask whether additional information is needed. John said DOE modified its plan based on this input.

John said the surface water, island sediment and deep core sediments have been completed. Sturgeon, walleye, sucker and carp fishing are in progress. He said DOE will have another phase during which it will look at a larger suite of contaminants. There are a number of surface-water contaminants, including metals and pesticides, and John said, besides radionuclides, it is difficult to determine what contaminants are Hanford-related. The river sampling data will be included in the remedial investigations at inland areas. John said the reactor areas and the 300 Area will also be included in the end of the process to collect the data into a final ROD. He said DOE plans to complete the fieldwork by the end of 2009. Upwelling is the last part of this work.

John said river sampling fieldwork will be completed this calendar year, and a draft report will be released in June. He said he could provide an update in January after the fieldwork is completed and before the draft report is released. Wade said Yakama Nation could report on its sturgeon sampling in January, and suggested a joint summary on the status of DOE's sampling and Yakama Nation's sampling plan.

Regulator Perspectives

- Emy Laija, EPA, reviewed notes from Laura Buelow, EPA, who is the point of contact for river sampling. Laura said she is happy with the progress of river sampling, including where it has been and where it is going.
- Ginger said she is glad DOE is coordinating with other agencies, and asked whether the data is being shared. John said this is still in progress, but for upwelling DOE is freezing that data and plans to share it as it is collected. He said the sampling is focused on Hanford, but there are many relative issues in the river so it needs to be coordinated. At the beginning of the river-sampling effort, DOE compiled all of the data along the entire river system.
- Ginger asked whether two rounds of upwelling testing were planned. John said DOE sampled in the spring and is currently sampling, so there will be two rounds of upwelling sampling. DOE also sampled the irrigation outfalls last fall and this spring.

Committee Discussion

- Shelley asked how deep the ‘deep samples’ are taken. John said deep samples go to the point of refusal. The deepest core was in the Snake River area and went 12-15 feet deep. John said there was a great deal of sediment in this area.
- Dale asked whether the Vibracore works in rocky areas. John said it is designed for fine sediment.
- Greg asked whether DOE is mapping only conductivity, and not contaminants. John said DOE has hand-drawn plumes, including contours and temperature profiles, and is now taking contaminant data. The plumes are being mapped for upwelling, temperature and conductivity. John said DOE has found higher conductivity in the groundwater than expected. The groundwater monitoring program has tested conductivity, and DOE is using this as it tries to determine whether the groundwater is going to the river.
- Greg asked whether the data is available for public review. John said it is not yet available, but DOE is considering making it available in a form similar to a risk assessment (RA).
- Shelley asked the implications of measuring higher conductivity than expected, and what DOE’s next steps will be. John said DOE is still working with the data to determine the implications of this. The next step is the characterization phase, and based on those results DOE will select sites to return to.
- Wade said there are two river cycles, including a river-dominant phase in which the head of the river is pushing against the aquifer, and a low-water phase when the groundwater is dominant and more chemistry is evident. Additionally, there are day-to-day fluctuations due to dam operations. He asked how these changes affect sampling. John said these factors shorten the sampling season. DOE is receiving real-time data, so it can see the effects of these fluctuations and dam operations.
- Wade said DOE looked at areas to be sampled and many places had a great deal of uncertainty. An effort to look at plumes and culturally sensitive areas in sections of the river was completed, and Wade said he thinks that would help resolve some uncertainty and future steps.
- Wade said the size of sturgeon sampling is small, so the resident time in the river of these fish was not during reactor discharge. Yakama Nation plans to test sturgeon larger than six feet to determine whether the contamination impacted sturgeon. Wade said this sampling will add to the collection of data.
- John said DOE has been discussing sturgeon collection with Yakama Nation, and is actively involved since this would be a DOE-funded activity. John said Dave Brockman, DOE-RL, would like to avoid removing large sturgeon, so DOE is working with experts to determine whether this is necessary.
- Wade said Yakama Nation has a treaty right to remove the sturgeon. The total number of large sturgeon for this study would be 30, but 23 of these would not be killed.

- Greg asked whether there is a reason DOE is not sampling steelhead. John said since steelhead have a large range, it would be difficult to ascertain Hanford affects from regional affects. Steelhead is an anadromous species, and not a resident fish.
- Greg asked whether DOE is sampling the organs for all of the fish species. John said sturgeons have separate livers and kidneys, and DOE decided to sample these separately based on mass. For the other species of fish DOE is sampling the same organs, but the liver and kidney are combined.
- Greg asked whether DOE is recording genetic deformities since the sampling is looking for contaminants. John said DOE is recording physical anomalies for all of the fish. He said a walleye with a tumor was caught, so DOE did separate sampling on that fish.
- Shelley asked when Yakama Nation plans to conduct its sturgeon research. Wade said this is planned for the spring of next year. A draft sampling plan will go to DOE for review soon.
- Next steps: John said river sampling fieldwork will be completed this calendar year, and a draft report will be released in June. He said he could provide an update to RAP in January after fieldwork is complete. Wade said Yakama Nation could report on its sturgeon sampling plan in January, and suggested a joint summary on the status of DOE's sampling and Yakama Nation's sampling plan.

100 Area RI/FS Work Plan

Dale provided an overview of RAP issue manager (IM) work on the 100 Area remedial investigation/feasibility study (RI/FS) work plan. Dale said DOE has given several presentations on the work plan and he prepared comments on the document. Although the official comment period has closed, DOE said it would consider any advice or comments from the Hanford Advisory Board (HAB or Board).

Dale said the work plan is a document that has the purpose of identifying and resolving data gaps, but there were some problem areas in the document. He said the multiple-document approach creates a large document that is difficult to review. He said there were also parts of the document that discussed CP cleanup, the 300 Area, and tank waste that are not necessary. He said it seems that work on the river and decommissioning and removal of remaining 100 Area buildings should be part of the integrated work plan. Dale said the document includes plans for demolishing buildings but DOE may or may not sample under these buildings. He said he thinks the majority of these buildings are the sources of contamination, especially reactor buildings, and sampling should be completed in these areas.

Dale said there seems to be a tendency to downgrade the level of cleanup description, such as changing unrestricted use to unrestricted surface use and, for groundwater remediation, changing highest beneficial use to intended beneficial use. Dale said the

work plan only mentions the public process for the RI/FS at the end, and expressed concern that public involvement was not mentioned before then.

Dale said the work plan includes new technologies but does not mention the lack of success of using some of these technologies. Additional issues with the work plan are that the nine interim action RODs are not listed in the document, the hydrologic characterization of sediments does not recognize heterogeneity and horizontal influences, and that there is a data gap in the relationship of the exchange between groundwater and the river. For the Ecological Risk Assessment section, Dale said a sampling technique that accurately determines conditions in the hyporheic zone is needed. In Data Need 9, he said DOE should not exempt the zone of river-groundwater interaction from further study because a drop in contaminant levels over time was modeled. Dale said this implies that the contaminants will radioactively decay by the time they reach the river, and he disagrees with this since the velocities have not been adequately represented.

Dale reviewed comments on Addendum 1 of the work plan, which covers the 100-D/H Decision Unit. Dale said the River Protection Strategy section needs to include contaminant plumes that are at the river's edge, and he encouraged more sampling to define hexavalent chromium. Dale said vadose zone sources need to be identified since the contamination levels are based on data collected less than 11 meters deep in a zone that is 26 meters deep. Chromium has been identified as the contaminant of concern within the 100 Area, but Dale said other contaminants, such as strontium, need to be addressed. He said better definition of the source of contamination found in the Ringold is needed, and characterization is necessary below the reactor buildings. Dale said the geology in the river bottom needs to be defined and aquifer tubes should be sampled more frequently than the current two times each year. He said Hanford cleanup is also subject to the Resource Conservation and Recovery Act (RCRA), and this should be included in the plan.

Dale reviewed issues in Addendum 2, which relates to the 100-K Decision Unit. He commented that vadose zone transport is not well characterized, especially at depths, and high levels of contamination have been found at the bottom of what is sampled. Dale said a principle issue in the 100-K Area is hexavalent chromium, and characterization of groundwater contamination needs to be improved. He said there is a lack of recorded inventories in many of the chromium disposal sites and poorly supported modeling is being used to drive decisions. Additionally, Dale noted that there is not enough data to support fate-and-transport modeling, the flow and spread of contaminant fluids under the 100 Area are not well characterized, and there is little understanding of whether 100 Area waste sites have the potential to contaminate other groundwater or the river. Dale said reactor footprint characterization is needed, aquifer tubes need to be sampled more regularly, and river bottom geologic characterization is needed.

Regulator Perspectives

- Mike Thompson, DOE-RL, said DOE's policy on groundwater is to attempt to restore the aquifer to its highest beneficial use, and aquifer restoration has no tie to land use. He said if this changes DOE would use a proposed plan.
- Mike said DOE has not negotiated with the regulatory agencies in terms of compliance with ambient regulatory standards, and the milestones the Tri-Parties recently agreed on gave guidance on when to do this. The ROD for interim actions used the 1-1 dilution standard because that was the least amount observed in samples from the 100 D/H Area, but that does not mean DOE will automatically use that standard since they will factor in techniques that have since become available. Mike said this would need to be a negotiated position put forth as part of a proposed plan before it gets into a ROD. RAP members, Ecology and EPA suggested that this be stated at the beginning of the work plan document.
- Regarding exempting the zone of river-groundwater interaction from further study because of modeling a drop in contaminant levels over time, Mike said this would only happen if DOE is able to show that the aquifer has been cleaned to levels consistent with River Corridor (RC) cleanup, but it needs to develop a plan for sampling.
- Mike said a more detailed explanation of the process for contamination in Ringold Unit B may be needed for the D/H Decision Unit Addendum document.
- Mike commented that RCRA is always included in the cleanup process as an applicable or relevant and appropriate requirement (ARAR) under CERCLA.
- Dennis Faulk, EPA, commented that he thinks more is known than is portrayed in the 100 Area work plan. He said any serious groundwater contamination has been profiled. The comprehensive land-use plan (CLUP) is just one consideration in regard to adjacent land use, and Dennis said EPA has worked with DOE on language for this. He said he is focusing on the data gaps at each individual operable unit (OU) and the critical data needed to make final decisions. Dennis thinks the 100 Area has had a robust cleanup and overall cleanup along the river has been positive. There are data gaps that need to be filled, but he said there will always be uncertainty and the agencies make decisions using the best available information. He said he thinks the information being collected along the river goes above and beyond what is required, but ultimately it is uncertain whether remedial actions will be tied to a specific decision. Dennis said he hopes the data will determine that there are no adverse impacts that need remedial action from Hanford.
- Dennis said from his perspective the 1-1 dilution amount is conservative and could increase based on new technology.
- Les said Ecology is involved in workshops to resolve comments on the addendum and RI/FS. Ecology has worked with DOE and its contractor to look at the 100 Area, and Les said Ecology is focusing on the data gaps. All of the information being compiled and past comments will be incorporated into the second round of documents, so all suggestions are helpful.

- Mike said he thought Dale compiled a good set of comments. There are some issues he thought resulted from inadequate descriptions, and he will pass the comments along for these sections. Mike said the use of executive summaries is a suggestion he also made, and DOE is considering having an executive summary and a more detailed technical summary. He said DOE will be producing a great deal of work plans and they will be released quickly, so the comments provided were insightful. Mike said DOE will take the information under consideration even though it is not yet formal HAB advice.
- Dennis said making sure base assumptions are correct and adequate is an important, policy-level topic. He suggested the RAP consider the document in a larger context to determine the pivotal aspects that are needed to create a reliable model for future documents.

Committee Discussion

- Dale reviewed comments Gerry Pollet sent to him on the 100 Area Work Plan. Gerry said there is too much information in one document and there is not a publicly understandable summary of the proposal and how it affects public concerns. Gerry said there should be an annual schedule of documents that will be released, including how they relate to each other and how they address public concerns. Gerry commented that one major issue is the contents of the proposed work plans, which he said are being made without recognition that there is no reasonable certainty about waste quantities or their characteristics. He said there is a lack of consideration for aquatic habitat and ecological impacts.
- Shelley said Dale provided specific comments, but RAP members also need to think about principles and overarching issues, possibly by referring to past advice. She said Ecology and EPA have already submitted substantial comments, and it will be important to synthesize important issues if the Board wishes to issue advice.
- Shelley commented that Ecology has written a letter to DOE stating that there are errors and omissions and there is a need for additional meetings. Ecology included six bullets that are primary in importance, and Shelley said one aspect of these is establishing a target analysis for contaminants of concern. She asked whether there is a need for the RAP to look at these and weigh in on the process. Les said Ecology's intent was to identify the principle issues up front and provide DOE with the greatest possible opportunity to address these issues. He said Ecology has made more of a proactive determination by providing a suggestion for this process that resulted in more integration. Les said Ecology is recommending addressing major issues at the beginning of the process and discussing these earlier than in the usual process.
- Greg said when looking at the documents from a policy level it is important to look at what DOE is trying to do, where they are going, whether the assumptions are valid, and what they have for a backbone that defines the end state. He said the 100 Area work plan shows that there are fundamental disconnects in the primary base assumptions.

- Greg said ecological standards is one disconnect in the work plan. He said there is no definition of the standards that will be used to protect the ecosystem. The 0.1 RAD assumption has not been adopted by EPA, Ecology, United States Fish and Wildlife Services (USFWS), other agencies, the tribes or the public. Greg said this must be defined early in the process, as sampling may change once it is defined.
- Greg said CERCLA's relationship to the NRDA process is another assumption that needs revision, as DOE has not factored in the trust responsibility **in their decision making**. Greg said there is no mention in the 100 Area plan or the 200 Area RI/FS regarding CERCLA and NRDA and the potential damages that might be assessed if DOE does not meet the protection standards of the tribes. He said these requirements should be factored in to determine what should be done for sampling plans and other cleanup issues. DOE needs to have in their decision matrix the requirements under CERCLA/NRDA, the agreed to ecological protection standards and the total life cycle costs of using institutional controls (ICs).
- Mike said there is a policy within DOE that, when possible, DOE can include National Resource Trustee Council (NRTC) components as the process moves forward, but that will not be an integral part of an RI/FS CERCLA work plan, as this is a legal document that is part of meeting CERCLA requirements. Greg said NRDA sets ecological protection standards at one level, and it is important to determine whether this is a DOE, tribal or state level. He said if the sampling analysis plan (SAP) assumes the protection level is 0.1 RAD a day, it is critical that this be included in the documents.
- Greg said the assumption that the groundwater can be contaminated for a period of up to 150 years is a third assumption that the RAP needs to look at. **He said the 150-year timeline was given to the Exposure-Scenario Task Force in 2002**, but it has not been agreed to. **He said this standard assumes it is acceptable to allow contamination to remain and to potentially dose receptors in the eco-system for another 150 years.** Greg said without ecological protection and NRDA standards factored in, the planning includes assumptions that could change in the future.
- Mike said the 150-year issue is not real, as the milestones include framework for the proposed plans and decisions.
- Greg said ICs are another issue the RAP needs to address. He said he does not think federal agencies have the **ability to defer these to other yet undefined entities, and this could become a huge future un-costed liability.**
- Mike said there will likely be some instances in which there will be ICs or land-use controls.
- Greg stated that the final issue with this document is the flood scenario on the Columbia River. Greg said the document assumes the river will stay fairly static over time, but the Army Corps of Engineers assumes that in 100 years the dams will be removed. **Greg said many EISs use a flood scenario of dam failures. He also said DOE has failed to assess global warming and climatic change and what this will do to waste that is left in place.**

- Greg said future planning and decision-making needs to factor in these issues. He said the overarching base assumptions are not being used and could create more liability and cost in the future.
- Harold Heacock said Dale devoted a considerable amount of work in developing his comments. He said the majority of the discussion regarded technical, detailed issues, rather than policy-level issues. He said if the RAP decides to write advice, it needs to elevate the comments to a policy level.
- Pam Larsen said Susan Hayman, EnviroIssues, sent the comments Ecology and EPA submitted to DOE to the RAP IMs. She suggested IMs look at the agency comments and Dale's comments to formulate policy-level advice. She said she agrees that flood planning needs to be factored into the plan.
- Dale said there are overarching topics that the HAB may wish to issue advice on. He said the documents include models that were used to drive the assumptions, but it is important to sample in all possible locations, and he suggested that this be an advice topic. Also, Dale said the CLUP is being used to drive decisions about cleanup, and he would like to reinforce that this should not be done.
- Wade said when looking at the topics and intent of the reports it seems there are a lot of gaps in integration. He said the base driver is that DOE will ultimately complete a RA for closure of all 100 Area sites, and expressed concern that cleanup has been accelerated but characterization has been ignored. Wade said time is needed to look at the data gaps, determine the seriousness of the gaps, and look at how the work is going to address them.
- Greg said the issues with assumptions and disconnects in the foundational pieces of the plan could be policy-level advice. In order to deal with these, RAP must determine how to deal with these and give that to the decision-makers. Greg said RAP could suggest conducting a workshop to deal with these issues in detail in order to have an answer for regulators. He said this is timely, and advice could be brought forward at the September Board meeting. Greg said the advice should be simple and approximately two or three paragraphs.
- Greg will draft the advice on the 100 Area RI/FS work plan and send it to Bob, Shelley and Dale. Susan Hayman will distribute the advice and collect comments.

Potential Advice Topics (as captured in flip chart notes by Susan Hayman)

1. Modeling/data analysis
2. CLUP and its application to making decisions/driver for cleanup?
3. Base assumptions are supportable? (Reference Greg's list from 7/23 RAP summary)
4. Integration (Issues associated with this)
5. Characterization - data gaps

Hanford Site Cleanup Completion Framework

Matt McCormick, DOE-RL, provided an overview of the Hanford Site Cleanup Completion Framework, a description of Hanford cleanup. He said the purpose of this document is to determine how individual cleanup decisions affect the overall cleanup of the Hanford site. Matt said the document, written from DOE's perspective, is meant to describe Hanford cleanup, regulatory drivers, cleanup goals and the CERCLA process for completing cleanup of a National Priority List (NPL) site.

The document has three major components – the RC, the CP and tank waste. Matt said the site completion framework also describes what happens after cleanup is completed, such as long-term stewardship (LTS) and land-management considerations. He said the document is meant to be an information tool to describe Hanford cleanup, not a regulatory decision document or a Tri-Party document. The site cleanup completion framework focuses primarily on CERCLA, overall cleanup goals, how cleanup is being done, how DOE determines when cleanup is complete, and LTS.

Matt said DOE plans to release the Hanford Site Cleanup Completion Framework for public comment, which would start the week of August 17 and continue through the following 90 days, until November 15. The document could also be reviewed by HAB committees and advice could be issued in early November, if needed. Matt said DOE plans to reference the document in certain decision documents, such as a CERCLA RI/FS or appendix of a work plan. The document does not make cleanup decisions, but it describes Hanford cleanup in one document to provide an understanding of the context of individual cleanup decisions. The document describes some policy, such as DOE's policy or strategy related to the order of cleanup and objectives and goals. Matt clarified that the Hanford Site Cleanup Completion Framework is not the CP cleanup completion strategy, and the CP strategy document is a separate document that will be in draft form by the end of this month. Matt said the Hanford Site Cleanup Completion Framework was shared with EPA and Ecology this spring, and DOE received and incorporated their comments.

Regulator Perspectives

- Dennis said outside of the use of the CLUP, he thinks the document is an accurate representation of discussions regarding Hanford cleanup that have taken place during the last several years. He said the lack of a roadmap for Hanford cleanup has been an issue in the past, but this document fulfills that need.

Committee Discussion

- Greg asked what other state and federal agencies will be receiving comments. Paula Call, DOE-RL, said after committee and public comment, DOE will incorporate comments and update the document to add the CP strategy. DOE will publish the final version in the spring. Paula said there will be a Web site where comments can be submitted, and a postcard will be sent with information on where to send comments. She said it will also be included on the Hanford Public Involvement calendar.

- Pam asked whether there was a resolution to DOE litigation. Matt said the change packages of the tentative agreement went through public comment, which ended in the middle of May. Those comments were reviewed by the Tri-Parties and responded to through a summary response document. Based on the comments, adjustments were made to the change package, which the three principals signed on August 11. Matt said DOE still has deliverables due to regulators at the end of the year, including a change package on the M-15 milestones as well as a change package on the M-91 series of milestones on legacy, TRU and mixed low-level waste (MLLW). The comment response package will be posted, and Matt said milestones on the RC are now TPA milestones.

100K Basins Closure Project Update

Tom Teynor, DOE-RL, provided an update on the 100-K Basin Closure Project and the demolition of facilities in the 100-K Area. DOE-RL revised its map based on public comment, and divided it by base and ARRA funding to determine a plan for 2015 and beyond. Tom said DOE has completed the definitization stage with the contractor, including an agreement on the work scope. ARRA funding accelerated chlorine vault pad demolition. Tom said one significant change is that DOE completed a 30 percent design review on removing the core of the reactor, and if this goes forward K-East will be completed first and its reactor core will be removed. Tom said this could be removed remotely, and DOE would take out the process tubes with the core. DOE recently found out that graphite meets waste acceptance criteria (WAC) for the Environmental Restoration Disposal Facility (ERDF). Tom said DOE reviewed the safety bases of this option and the hazard category is a category three.

Tom said the K-East Basin is 90 percent complete and should be finished by August 27. DOE has been taking soil samples to start analysis and characterization. Tom said since the soil is lightly contaminated, DOE is using additional soil to blend the contaminated soil as it slopes it in order to minimize the amount of material send to ERDF. There are limits to the amount of contamination that can be transported, so DOE must blend the soil to reduce the overall dose. Tom said the basin removal operations include taking three feet under the soil and conducting a sampling characterization campaign to determine whether remediation is necessary. Tom said the August 27 completion date is later than the original July 2009 date due to the higher dose found.

Tom reviewed recent accomplishments for sludge removal in the 100-K Area. He said this was done in two phases – first, packaging the sludge and taking it to the CP on an interim basis, than packaging it to send it offsite to the waste isolation pilot plant (WIPP). Tom said this would allow DOE to remove the sludge from the river, with the goal of completing this by December 31, 2014. The core removal option would allow for acceleration of cleanup in K-West. Tom said DOE recently completed engineered container sludge sampling, and analysis of this is currently in progress at the Pacific Northwest National Laboratory (PNNL). DOE also recently completed a boroscopic inspection of settler tubes and found that the material is very fine, a finding that will help design the system. Tom said DOE also completed phase three of knock-out pot (KOP)

inspections and found 675 pounds of material to be sorted and washed at a later date. The floor sampling sludge campaign was completed early, and DOE is currently scheduling and preparing for a Technical Readiness Review for the Sludge Treatment Project October 5-16.

Tom reviewed findings on the contents of the basins. He said the material in K-East is like fine sand, while K-West sludge has more granular materials due to the fuel washing operations at that location. Tom reviewed pictures of the sludge after an initial density sort, all of which is done underwater. He reviewed the Sludge Treatment Project plan overview. Phase one of this process includes top retrieval, load and transport, and interim storage in T-Plant or an alternate facility. Phase two of the process includes load and transport, oxidizing and packaging the material remotely, and transport to WIPP for disposal.

Regulator Perspectives

- Les said Ecology is supportive of this effort.
- Larry Gadbois, EPA, stated that EPA has supported the cleanup plan DOE is now working to for well over a year. He said EPA supports DOE's inquiry into removing the K East reactor as an alternative to interim safe storage.

Committee Discussion

- Pam asked whether there is a possibility of conducting separation at the basins. Tom said there are too many issues with this approach. DOE plans to do a density sort on the KOPs, and coarse portion will go to the cold-packing dry facility, then storage at the canister storage building (CSB). Tom said DOE plans to redefine KOP and tube sludge based on the design parameters.
- Bob asked how new TPA milestones affect sludge treatment. Tom said as of March 31, 2011, DOE must submit new milestones for the sludge treatment project. DOE is restructuring the project with the goal of completing sludge treatment sampling operations up front. Tom said the plan for the KOPs is to transport this material to CSB in the second quarter of 2012, and the goal is to get an engineered container to interim storage at T-Plant or an alternate facility by December 31, 2014.
- Pam suggested that this might be a great presentation for the HAB in the future.

Budget Advice

Harold said a July workshop covered the fiscal year (FY) 2011 budget and cleanup priorities, including accelerated funding issues. The workshop reviewed budget priorities, and afterward the HAB members who attended developed a list of workshop impressions and budget and advice principles. The Budget and Contracts Committee (BCC) developed draft advice and hoped to gather RAP input, including priorities, on the FY 2011 budget and work plan before the September Board meeting.

Harold reviewed workshop impressions. He said there has always been a gap between funding and the number of items that need funding, but the accelerated funding closed many of these gaps for FY 2010 and 2011. Harold said the forthcoming Tank Closure and Waste Management Environmental Impact Statement (TC&WM EIS) will set priorities for cleanup. The HAB members who attended the workshop decided the Board should be consistent with its current priorities and developed a list of budget advice principles.

Gerry drafted potential advice, which was reviewed at the BCC meeting. The committee determined the advice needs to be shortened and more direct. Harold said the BCC also hoped to get input on priorities from other committees. Harold will take the input from the RAP and suggestions on the draft advice and distribute a revised draft by August 18. He said he would need input no later than August 17.

Agency Perspectives

- Rich Holten, DOE-RL, said in the fourth paragraph of the advice, the Board should not state that DOE is proposing to reduce annual TRU retrieval by “as much as tenfold” without looking at quantities. He said he could provide the exact quantities to Harold.
- Paula said DOE based its request on proposed changes brought to the public, but this is now out of date because the milestones were recently finalized.
- Larry Holstrom, WCH, commented that in directions to DOE-RL at the bottom of page three the advice identifies high priorities, and this could create the assumption that items that are not included, such as groundwater, are not a priority.
- Les suggested adding a statement that supports the newly adopted TPA milestones in order to take care of the treatment plant as well as waste treatment milestones.

Committee Discussion

- Pam asked when the new package would be distributed. Paula said it is on the Web site as part of the administrative record, but will not be distributed. Susan Hayman will distribute either a link or the document to the Board.
- If RAP members have additional comments, they should send them to Harold and copy Susan Hayman and Pam.
- Pam suggested revising the sixth priority in the advice, under DOE-RL, so it reflects information the RAP received on the K Basins. She said the advice could state that the Board is encouraged by progress on the K Basins and this work should continue to be funded.
- Bob suggested that RAP members review the list of priorities in the fifth item in the advice to determine whether these are the correct priorities for RAP.
- Pam said she does not think there is a plan for a facility to treat RH TRU. Rich said there is still a plan, and CHPRC has revised its plan to consider using new technology

from Arriva in France that provides the capability to retrieve, treat and package RH TRU, although this may not necessarily be a facility.

- Pam said RAP should continue to emphasize groundwater and the vadose zone as priorities.

RAP Input to Draft Budget Advice (as captured in flip chart notes by Susan Hayman)

1. Should reflect new information from K Basin – Encouraged with new milestones and encourage continued funding
2. 5c: Capability to treat, rather than stressing facility
3. General statement supporting newly adopted milestones (mentioning GW/vadose zone, other continuing priorities)

Long-Term Stewardship/Institutional Controls

Doug Mercer introduced the discussion on LTS and ICs. He said DOE feels it lacks the resources and time to address perceived shortcomings in LTS planning. He said Boyd Hathaway, DOE-RL, was in charge of this program but has been busy working on the environmental assessment (EA). Doug said he does not want DOE to take actions that do not support the overall cleanup objectives. He said he has not spoken to anyone at DOE, so for the gap analysis he has clarified what the RAP anticipates doing. He said he thinks the RAP should decide whether it should pursue the issue in consideration of other priorities.

Doug said he has reviewed the planning that has taken place during the last couple of months and DOE took extra steps from when it was outlined in 2002. He said DOE is doing stewardship now, and he thinks DOE at Hanford is doing a better job with LTS than other sites in the country. Doug said stewardship keeps getting delayed, and he is anxious to start a conversation on this issue. He suggested that if Boyd and the new contractor come up with a document the HAB could review it, but he emphasized the importance of engaging the Board early in the process. Doug said it is important that DOE have ideas about implementing LTS as the CP comprehensive cleanup process is developed.

Doug said he would like the opportunity to talk to those involved and ask the questions identified in the LTS gap analysis plan. He suggested that he could work with Boyd to update the HAB on the status of LTS and ICs, including the process for engaging the HAB and interested stakeholders.

Agency Perspectives

- Paula said DOE feels this is an important issue, but it is in the work scope of the Mission Support Contractor (MSC), which is not on board yet. She said there are different management plans that have LTS components, and Boyd has been having

Fluor Hanford, the contractor, review them to pull out those components and the MSA will pick up this work once the transition happens.

- Nick Ceto, DOE-RL, said DOE is constantly doing stewardship, including inspections of sites, maintenance of facilities, surveillance and monitoring. DOE has ICs it is required to follow and conducts five-year reviews to ensure ICs are being implemented. Nick said what has been lacking is coordination of all of these efforts. As DOE finishes work along the river, scheduled for 2015, and starts major work on the CP, he said it would be productive for DOE to have a sense of what the community feels is the best way to institute LTS and ICs. Nick said ultimately DOE needs to think about the best way to do LTS on those facilities, which will be a continuing process until there is a clear transition.
- Nick clarified that the transition team will be done in one month. He said Doug Shoop, DOE-RL, asked that DOE look at its requirements and try to determine what can be used from other documents.
- Nick said establishing the plan depends on the final remedy, and designing an LTS plan before decisions on the end state are made would create a reliance on assumptions. He said DOE needs to spend time sorting through additional issues because the ICs must define cleanup. Doug said he understands the issue of timing of ICs. He said ICs have been thought of as engineering or science issues, including identifying science barriers. Doug suggested that the best way to perceive LTS is to have Hanford as a specific place to show LTS.
- Nick said DOE built a visitor center at a different site to show what has been cleaned up and what has been left behind, and determining what this will include is where the DOE will need input from the HAB. Doug said he is concerned that DOE may not be taking control of opportunities that could be used now. Nick said he thinks DOE will do this on an ongoing basis, and has already had some discussions about the B Reactor, the Visitor's Center, and how these relate to LTS.

Committee Discussion

- Pam said the Board received a letter from the Tri-Party Agencies that listed priorities they hoped the HAB would focus on, and LTS and ICs were part of that list. Paula said the issue has a number of components, and DOE has been working on pulling together policy and law requirements, as well as pulling elements related to LTS and ICs from existing resource management plans and once they have a good understanding of what's needed to move the LTS program forward, will engage the HAB. She said because this program is currently in a state of transition the discussions HAB members hope to have with individuals at DOE Headquarters (DOE-HQ) may be premature.
- Pam asked for clarification on the Government Accountability Office (GAO) report's statement that RCRA, rather than CERCLA actions, require ICs. Les said this is because RCRA usually leads to clean closure. Pam suggested it would be helpful to learn what EPA is working on at a later date. She said the site is moving toward final RODs, so a follow up to learn what will be included in the final RODs is important.

- Greg said planning in the 100 Area engineering evaluation/cost analysis (EE/CA) and other documents assume ICs. He expressed concern that DOE is planning for ICs rather than doing RCRA, which assumes clean closure, and that there is little oversight from DOE-HQ. Greg said it is important to clean up the groundwater and define ecological protection levels. He said it is inappropriate for DOE to defer to ICs when the total life cycle costs are not being addressed and there is a huge assumption that some yet to be defined agency will be doing this work in the future. He said without knowing elements such as NRDA and ecological protection it is difficult to determine requirements for final Hanford cleanup. He said he is interested in the decision process to get to the final RODs.
- Nick said the RI/FS process includes ICs, how they will work in the long term and how much it will cost. The RI/FS Work Plan for the 100 Area is completed, and Nick said DOE has a clear goal of not assuming ICs now and to do the best cleanup possible.
- Doug said he would like to see a document that ensures that these issues will be considered as part of the process.
- Nick said on ecological chemical standards DOE uses Ecology's screening levels and develops site-specific levels for Hanford. DOE uses the same kind of thought process for RAD, and is taking it seriously. Nick said DOE needs to get the science done and have good values. Nick said for advice it would be interesting to have HAB and public input on the use of the site. For example, if a reactor is fenced off and sits for 20 years, it would be helpful to gather local input and help on how to establish systems for the best way to open up the site.
- Doug said developing a relationship with the site so the public understands what is there is an important part of stewardship, and five-year reviews and deed restrictions will fail if these issues are not resolved. He said the HAB would like to learn this now and ask project managers how the LTS plans built into the system work. Nick said there are staffing issues, but many senior managers understand LTS and bring it up in discussions.
- Susan Hayman said the HAB has issued advice on ICs and proposed having Doug and Bob work on it and bring back proposal to the committee. Doug said he would need access to people who work on LTS and ICs within DOE. Paula suggested setting up a call or meeting with the IMs and Boyd.
- Doug suggested that it would be helpful to have a process chain of responsibility for LTS for each agency in order to determine who is responsible for doing what and to look at reliability and accountability. Doug said asking for interfaces and assignments within and between organizations would allow HAB to apply some likelihood that the behaviors will occur. Nick said he could provide this.
- Greg commented that Nick committed to providing the current process for LTS, and said he would like to see what DOE currently uses for LTS, ICs and the process for protectiveness. Several committee members and Les also expressed interest in this document. Nick said he would provide the decision logic and matrix that is used to

assess protectiveness standards, LTS, ICs and other assumptions, including CERCLA and NRDA implications.

LTS - What Next? (as captured in flip chart notes by Susan Hayman)

1. Call or meeting with Boyd and IMs
 - a. Make plan for additional contacts (per page 3 of Doug's memo to Paula Call)
2. Ask DOE to provide RAP flowchart/matrix that identifies protectiveness standards (what DOE is currently using) and how LTS/ICs are addressing these (including CERCLA, NRDA piece) and other assumptions (re: Nick Ceto's)
3. Diagram interfaces and assignments within and between organizations (Doug's diagram)

NEPA/CERCLA/RCRA Presentation Framing

Bob said RAP asked for a presentation from Craig Cameron, EPA, and John Price, Ecology, on the NEPA/CERCLA/RCRA processes. Cameron and John have asked RAP members to identify specific issues they would like to cover during the discussion.

Committee Discussion

- Bob suggested that the presentation include the differences between the processes and which one applies to the different cleanup efforts at Hanford. Dale added that this discussion could also include the overlaps between the processes, and whether one process trumps the other.
- Dale asked for a clarification on terms such as corrective action decisions (CADs) and RODs and a description of how they apply to cleanup.
- Vince asked that a map for the 200 Area on the CP that shows which areas will have performance assessments and which will have CERCLA be included in the presentation.
- Vince commented that it would be helpful to understand how the CERCLA process complies with DOE Order 435.1, which requires performance assessments.
- Bob suggested including the requirements for RCRA and CERCLA closure plans, including the different products and the steps required for each process.
- Shelley asked for clarification on explanations of significant difference (ESDs).
- Greg said he would like to hear the process regulators go through to internally choose the lead regulator and what the tradeoffs are when this happens.
- Bob asked for clarification on how the National Environmental Policy Act (NEPA) and State Environmental Policy Act (SEPA) regulations fit with RCRA and CERCLA.

- Paula suggested including an explanation of the EE/CA action memo process and how this relates to the RI/FS ROD process.
- Greg said that he found in the document a provision where EPA Region 10 made a deferral stating that they do not have to do a baseline RA. Greg expressed concern that this is an issue that needs to be looked into by the committee.
- Bob asked for an overview of the nine CERCLA criteria and balancing criteria.
- Ginger suggested using tangible examples from Hanford to provide context for the discussion.

Brainstorming NEPA/RCRA/CERCLA Discussion (as captured in flip chart notes by Susan Hayman)

*Use examples at Hanford to provide context

1. What are the differences, overlaps and trumping possibilities?
2. Which apply to the different cleanup efforts/sites? (CP, RC) - Map
3. What are CAD-RODs and how do they apply?
4. DOE order 435.1 - Requirements for PA versus CERCLA - How does the CERCLA process comply with 435.1?
5. Requirements for CERCLA/RCRA
 - a. Post closure plan
 - b. Other products
6. Explanation of significant differences
7. Where are the “fights” (tradeoffs)?
 - a. How is the lead regulator chosen?
 - b. What are the consequences?
8. What is the relationship between NEPA/SEPA and RCRA/CERCLA?
9. EE/CA action memo process in relation to RI/FS ROD (bias for action)
10. Deferral of baseline risk assessment under CERCLA
11. Comparison flowchart?
12. What are the “CERCLA criteria” and balancing criteria?

Committee Business

Discussion

- Shelley suggested including an update on the status of ZP-1 and UP-1 at the September RAP meeting. Emy said the agencies have a meeting scheduled at the end of August, and she can follow up after August 27 on that status of these units.
- For the CP Strategy deliverable, Rick said he did not think the agencies would be ready to give a briefing at the September committee meeting, and suggested this be in October.
- Greg suggested that RAP should frame the “Base Assumptions” workshop for a future Committee of the Whole (COTW) discussion. He suggested that the first

framing discussion take place in September and the HAB workshop be during the first week of December.

- Emy suggested that an update on PW 1, 3, and 6 could be on the November or December agenda since there is a public workshop on these in December.
- Pam suggested an update on the plutonium finishing plant (PFP) in September, since the schedule for this may be accelerated.
- The RCRA permit will be released in October, and the committee suggested a briefing in December.
- Paula said DOE will give a new change package on the TBD dates for M-15 and M-91 to the regulators by the end of December, and suggested this item be included on the RAP's January agenda.
- The committee agreed on the following topics for the September RAP meeting:
 - Status updates on the schedule and processes for ZP-1, UP-1, PW 1, 3, 6, CW-5
 - NEPA/CERCLA/RCRA tutorial
 - Status update on the recent settlement briefing
 - NRTC presentation
 - Update on PFP
 - Planning for the base assumptions workshop

BIN/Follow-Up (as captured on flip chart notes by Susan Hayman)

1. Settlement agreement - impact on TPA agreements (public notice)
2. ZP-1, UP-1
3. PW 1, 3, 6
4. U.S. Ecology site - closure issues
5. 618-10 - Update on process/planning and characterization
6. Yakama Nation sturgeon sampling
7. Develop advice on "What does closure mean?" (HQ)
8. Hanford framework (Advice for November?)
9. Sludge presentation for HAB

Action Items / Commitments

- Chris said characterization will take place at the beginning of September and last until February, so a status update could take place in October on the process and initial characterization at 618-10/11.
- John said river sampling fieldwork will be completed this calendar year, and a draft report will be released in June. He said he could provide an update to RAP in January after fieldwork is complete. Wade said Yakama Nation could report on its sturgeon sampling plan in January, and suggested a joint summary on the status of DOE's sampling and Yakama Nation's sampling plan.

- Greg will draft the advice on the 100 Area RI/FS Work Plan and send it to Bob, Shelley and Dale. Susan Hayman will distribute the advice and collect comments.
- Harold will take input from the RAP and suggestions on the draft budget advice and distribute a draft by August 18.
- Susan Hayman will distribute either a link or the document on the new milestones to the RAP.
- Boyd and the LTS IMs will meet and plan for next steps.
- Nick Ceto, DOE-RL, will provide RAP with a flowchart or matrix that identifies protectiveness standards (what DOE is currently using) and how LTS/ICs are addressing these (including CERCLA, NRDA piece) and other assumptions.

Handouts

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

- 618-10 & 11 Burial Ground Remediation Planning, Chris Smith, August 12, 2009.
- River Corridor Closure Project: VPU and Caisson Characterization, Chris Smith, August 12, 2009.
- Columbia River RI Status Meeting, John Sands, August 12, 2009.
- 100 Area RI/FS Work Plan Comments, Dale Engstrom, August 12, 2009.
- Addendum 1: 100 D/H Decision Unit, Dale Engstrom, August 12, 2009.
- Addendum 2: 100-K Decision Unit, Dale Engstrom, August 12, 2009.
- 100K Basins Closure Project Update, Tom Teynor, August 12, 2009.
- Fiscal Year (FY) 2011 Hanford Clean-Up Budgets and Priorities Draft Advice v.0, Gerry Pollet, August 12, 2009.
- HAB Work Order Request for Long-Term Stewardship, Doug Mercer, July 21, 2009.

Attendees

HAB Members and Alternates

Shelley Cimon	Pam Larsen	Wade Riggsbee
Greg DeBruler	Vince Panesko	Bob Suyama
Dale Engstrom	Doug Mercer (On phone)	Gene Van Liew
Harold Heacock	Steve White	

Others

Paula Call, DOE-RL	Rick Bond, Ecology	Barbara K. Wise, CHPRC
Nick Ceto, DOE-RL	Les Fort, Ecology	Janice Williams, CHPRC
Mike Priddy, DOE-RL	Ginger Wireman, Ecology	Susan Hayman, EnviroIssues
John Sands, DOE-RL	Craig Cameron, EPA	Molly Jensen, EnviroIssues
Chris Smith, DOE-RL	Emy Laija, EPA	Joe Bartosza, USFWS
Tom Teynor, DOE-RL	Larry Gadbois, EPA	Peter Bengtson, WCH
Mike Thompson, DOE-RL		Ryan Dodd, WCH
Rick Holten, DOE-RL		Jack Donnelly, WCH

		Jennifer Draper, WCH
		Larry Holstrom, WCH
		Jeff Lerch, WCH
		Nelson Little, WCH
		Dave Rowland, Yakama Nation