FINAL MEETING SUMMARY

HANFORD ADVISORY BOARD
RIVER AND PLATEAU COMMITTEE MEETING

January 10, 2012
Richland, WA

Topics in this Meeting Summary

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.

Opening

Dale Engstrom, Oregon Department of Energy and River and Plateau Committee (RAP) vice-chair, welcomed the committee and introductions were made. The committee adopted the December meeting summary.

Paula Call, Department of Energy-Richland Operations Office (DOE-RL) introduced Tifany Nguyen, DOE-RL, who recently joined DOE-RL. She will be working closely with the Hanford Advisory Board (Board or HAB) as well as on other public involvement activities.

Paula also provided a status update on the Plutonium Finishing Plant (PFP). She said DOE is shifting its focus on glove box removal and restructuring the work to focus on three critical projects in tandem: the glove boxes, the Plutonium and Americium Reclamation Facility, and removing highly contaminated process vacuum lines. She said this re-focus was prompted by the need to transition from American Recovery and Reinvestment Act funding and peak workforce during 2009-2011 and represents a more efficient way to prepare PFP for demolition. She said

the contractor will also be gaining efficiencies by using new, larger waste containers starting this spring. These will reduce the number of glove boxes needing to be size-reduced and reduce the time needed to dismantle them. PFP is on track to be slab on grade by 2015, which is a year ahead of the milestone. She said that DOE would provide a more detailed briefing in the future if the committee is interested.

Record of Decision: PW-1,3,6/CW-5

Issue Manager perspectives

Shelley Cimon, Public-at-Large, introduced a draft letter from the Board regarding the Plutonium process water (PW) Waste Sites 1, 3, 6, (PW-1,3,6) and cooling water Waste Site 5 (CW-5) record of decision (ROD). She said committee members at the previous RAP meeting agreed to write a letter stating the Board would like direct responses to advice in a form that can be posted on the website.

Shelley said the draft letter addresses several issues (Attachment 1: Draft HAB Letter Regarding the PW-1,3,6/CW-5 Record of Decision; Attachment 2: Draft RAP email submittals regarding the development of the PW-1,3,6/CW-5 work plan). First, the Board has received point-by-point response to advice in the past. However, the Board's comments on PW-1,3,6/CW-5 ROD were included in the comments and responses document attached to the final ROD. The Board could not post the response to the advice points directly on the HAB website because of the length of the document, although a link was provided to the overall response document. It has been difficult to follow how the agencies responded to each point of the Board's advice. Shelley added that the ROD does not address much of the sentiment the Board put forward in terms of advice. She said the Board wanted as much plutonium removed from the waste sites as possible, which has been stated in past HAB advice.

Vince Panesko, City of Richland, said he did not meet with DOE, but has done a great deal of research on plutonium mobility and would like to clear up a few points. Vince said that plutonium has reached the groundwater (referenced Dash 5 crib), and that DOE and other agencies should not be telling the public that plutonium did not reach the groundwater. There is a Battelle document with data showing plutonium reaching groundwater. New contractors were brought onto the Hanford Site who do not know the history and have not seen these documents.

Vince said another misconception he would like to clear up is that plutonium is not mobile. Battelle documents describe how when water hit acidic soils in Area Z-1, the plutonium

dissolves and becomes mobile. The impression from reading DOE documents is that the plutonium is permanently fixed in the soil, which is incorrect.

The third point Vince mentioned regarded long-term site management practices. Battelle documents from several agencies state that they do not really understand the chemistry of transuranics at the subsurface. In order to manage plutonium for hundreds of years it is important to understand the chemistry. Battelle documents state they do not have enough information about plutonium in the subsurface.

Vince said these are questions for the Board to consider long-term. He believes the agencies should be working on understanding plutonium behavior in the vadose zone and not planning to leave plutonium in place when the chemistry is not understood. Chemistry and solubility are the most important elements to understand before issuing a ROD. Vince suggested the Board could issue advice solely on the need for more information about plutonium in the vadose zone before establishing long-term management practices.

Agency perspectives

Paula said she understands the Board has two issues. The first issue is dissatisfaction with the actual decision in the ROD. The second is dissatisfaction with DOE's response to the Board's advice. Paula said DOE sent a thank you letter to the Board on September 6 explaining how DOE was responding to the advice and that it would be rolled into all other comments. She said the comment response document, which included all the Board advice points, was available on October 24. Paula acknowledged it was an oversight to not list responses to each of the Board's advice points in a separate document. She said DOE has since provided a separate document that lists responses to each of the Board's specific advice points in a way that can be easily posted to the website.

Emy Laija, United States Environmental Protection Agency (EPA) said EPA does not use a style that lists responses point-by-point. She said the larger question about the letter is angst among the Board over the actual ROD decision. There are still pending items of concern where the agencies and the Board do not agree. Emy asked for clarification on whether the Board feels the responses received on their advice points were insufficient or whether the Board is dissatisfied over the decisions made in the ROD. She requested the Board clarify whether the issue is with the quality of responses or the decision of the ROD.

Greg Sinton, DOE-RL, said he agrees plutonium has reached the groundwater, as shown in the annual groundwater monitoring report which is publically available. He does not believe the agencies made absolute statements about plutonium not being in groundwater. There are indications that plutonium reached groundwater in the 200 West Area during operations.

Greg said there was concern at the previous RAP meeting about the Ten Percent Rule. This rule states that ten percent of an effluent can be discharged. Once it exceeded ten percent, the discharge needs to stop. The RAP meeting focused on plutonium. Vince asked why discharges stopped at Z-9. Greg could find no reason for why discharges stopped to this crib, but there was a policy put in place (1973) at other sites to stop discharging organics.

Greg said definitive statements such as "plutonium does not move" are not accurate. Plutonium can be mobile depending on the circumstances. There are layers in the subsurface that can affect mobility. Greg said he does not think science will ever completely resolve the issue or end the debate. The most effective approach is monitoring to ensure that plutonium doesn't reach groundwater and to take action if it does. The mechanisms causing mobility are secondary. There should be enough data and characterization to make a decision.

Committee Questions and Response

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

<u>The Form of Agency Response to Board Advice</u>

C: What is the expectation with the letter? If the Board is expecting a response from DOE, there might not be enough detail to get a satisfying response to the questions that have been discussed.

> *R (from other Board members): The letter is a statement about how the Board feels about a specific situation and how the Board expects to be involved in the future. We are not expecting a written response. The letter can be modified to acknowledge DOE's efforts at providing a point-by-point response to the Board's advice. Our letter is an attempt to keep the dialog open and explain clearly the concerns with the form of response, concerns about this particular ROD because it sets precedent, and the interest in the Board to be involved in work plan development.*

C: While the revised point-by-point response is appreciated (including an excerpt from the Response Document to the Board's advice points), it is not sufficient. The Board presents issues as a collection of people with concerns, and a great deal of knowledge, about cleanup at the Hanford Site. Response to Board advice should not be rolled in with public comments because the Board is not "the public." The Board forms advice on consensus basis and is a group chartered to advise DOE and the other Tri-Party agencies.

> *R: DOE does provide point-by-point answers to all Board advice points. There have been occasions where DOE provided a comment response document attached to a thank you letter as opposed to a specific document only responding to Board advice. There is a long process*

that DOE and the other TPA agencies go through when responding to comments so the wording in the response document provided to the Board is the same as that in the larger comment response document.

C: It is important for the Board to request that agencies respond to Board advice point-by-point in the future, regardless of whether it is attached to a public response to comment document or not.

The Substance of Agency Response to Board Advice

C: There was agreement among those who attended the public workshops on the PW-1,3,6/CW-5 ROD that plutonium should not remain on site in the amounts being suggested. DOE responded by saying that they heard the comments and yet decided not to modify anything. There should be more dialogue instead of simply saying "no."

C: There appears to be a fundamental difference in how EPA and DOE-RL are interpreting "the observational approach." This fundamental difference in communication on the work plan between DOE and the regulatory agency raises concerns.

R: There is no disagreement on the observational approach. The phrase "observational approach" is not in the ROD. Dennis Faulk (EPA) and J.D. Dowell's (DOE-RL) differing views may be a reflection of differing terminology. DOE will assess the levels of plutonium after removing the required 2 feet of soil, and then determine if further action is warranted. Those agency discussions have not yet occurred. Those decisions will be made in the work plan.

C: Board Advice 247 is not referenced in the ROD. There should be a point in the letter about this. In the response document, there should be a reference to the source of the comment so DOE's response to that specific comment can be traced.

C: The Board clearly believes all plutonium needs to be removed. The Board needs to go on record acknowledging DOE's efforts to remove plutonium, while stating it does not meet the Board's expectations. Use of the observational approach should be stated in the ROD, because the ROD defines what the requirements are.

C: The ROD uses language such as DOE "may consider removing." This is a very weak statement. The ROD should speak to the criteria that will be used for decisions.

C: The Battelle documents also state that plutonium has been found in groundwater at different locations. The assumption in those documents is that the plutonium has attached to sediments

and remained in place. Even if plutonium does reach groundwater, it may become immobile in that area.

C: There is a problem with making definitive statements based on well data. Wells only reach a certain depth and sometimes materials can move laterally instead of moving vertically down. Statements that there is no plutonium are not quite true because it is not verified. Additionally, there are no wells downstream of potential groundwater contamination to help verify if plutonium did or did not reach the groundwater.

C: What is the length of time that should be modeled, since plutonium lasts forever? We need to act now with the information available. People who have worked on the Hanford Site and know what was put in the ground are an invaluable source of information.

C: If plutonium moves at a rate of one inch per year, it will move 2,000 inches in one half-life. Conditions will change at the site over the thousands of years it will require for plutonium to decay.

C: Signing the ROD when there is still so much scientific controversy and significant public comment against the remedy is a conflict with the requirements of the National Environmental Policy Act (NEPA). It is a huge problem when the best available science has two different conclusions. Additionally, monitoring is not the same as mitigation. It is too late when plutonium reaches the groundwater.

C: There are questions about the definition of observational approach. If there is still contamination after excavating two feet below the trenches, additional material should be removed. However, cost cannot be discounted entirely. There should be a judgment call about how much material can be removed at what cost.

R: The amount of plutonium left on site will be protective of human health and the environment based on modeling.

C: Monitoring should continue since material can move laterally, even if it appears that an area does not have any more contamination.

C: The public at all levels should have confidence in agency decisions. The cleanup should address and be responsive to public concerns. Whenever there is uncertainty and controversy in science, there is a higher-level of anxiety. If plutonium is found beyond the two foot excavation limit, there will be a risk-based decision informed by broader public concerns. Decisions should not be based on fear, but anxiety can play a role. Public concerns should have an influence over decisions if only to increase the level of trust the public has in those decisions. Public trust will make the decisions more effective.

C: There are four questions RAP should consider: 1) when will the work plans start being developed and do the issue managers and committee want to be involved in the development; 2) does the Board want ask for a modification of the ROD; 3) what will the Board use as a basis for comment (i.e. the documents Vince has); and 4) what is the definition of the observational approach? It will be helpful to think about these questions in a strategic way. The Issue Managers (IMs) should separate the technical issues from the policy questions.

R: The Comprehensive Environmental Response and Liability Act (CERCLA) is not designed to gather input on work plans. The Board is being contradictory. The Board should provide policy-level advice on the work plan, a detailed document. The Board has not commented on work plans before because those are not policy issues. How do you see your involvement?

Typically changes to RODs are made after a remedy is implemented. Changing a ROD prior to implementation of a remedy would require a legal basis, such as a lawsuit.

The committee discussed next steps for the issue. They decided to continue drafting the letter and hold IM discussions on how RAP might want to be involved with the work plan. The IMs will discuss technical issues the Board may want to offer advice on and how to comment on the observational approach. RAP will also follow-up with the agencies on possible workshops.

RAP discussed some wording changes to the letter. Liz Mattson, Bob Suyama, and Susan Leckband will work with Shelley to further revise the letter. Committee consensus will be reached through email. The next revision of the letter will go to committee by January 17.

River Corridor Cleanup, Using 100 K as an Example

Issue Manager perspectives

Dale said the 100 K cleanup represents a concern that is hard to define and understand for the Board. There should be a sequence of documents that must be completed for the remedial investigation/feasibility study (RI/FS) process. The first step is a risk assessment (RA) that defines the problem being addressed, then a process that defines the cleanup levels, followed by feasibility studies and a work plan. Currently, 100 K is in the work plan stage even though an RA has not been completed.

Dale said he is concerned after reading the Columbia River Component Ecological RA. He does not see the connection between the conclusions from that RA and how those translate into the work plan. Dale said the purpose of the day's discussion is to obtain a better understanding of that process. RAP will have a conversation to determine if this topic warrants further action by

the Board. He said the discussion at this point in the agenda should be more conceptual and only use 100 K as an example; a focused discussion on the 100 K Proposed Plan is later in the afternoon. The 100 K RI/FS is the first of many that will be issued over the next several months.

Agency perspectives

Larry Gadbois, EPA, gave some background on the RA process. He said the main purpose of an RA is to evaluate if there is a need for action (Attachment 3: Risk Assessment in the RI/FS Process and Derivation of Cleanup Levels). DOE has been conducting remediations in the River Corridor using multiple versions of an RA for a decade and a half. A qualitative RA was developed in the 1990's with the knowledge that there was a need for more in-depth analysis. This RA identified a basis for action and provided a justification to begin remediation, but a more thorough RA is necessary to make final cleanup decisions.

The River Corridor Baseline Risk Assessment (RCBRA) began in the early 2000's with public meetings and scoping. The purpose of the RCBRA was to determine the effectiveness of the interim actions that had been ongoing for almost a decade. DOE was especially interested in releases from the Hanford Site to the Columbia River, so a specific RA was completed to examine those risks. These results are just becoming available. DOE completes a very focused RA as waste sites are closed. There are many RAs available to use for the 100 K RI/FS report. Additional site data has also been collected over the last two years to fill in gaps.

Jim Hansen, DOE-RL, said smaller sites would not have a separate RA, while many larger sites around the country do have independent RAs that feed the RI/FS. The Columbia River Component is directly applicable to the 100 K Area as is the RCBRA.

Larry said the RCBRA Human Health Risk Assessment contained multiple scenarios. The Industrial Worker and Subsistence Farmer are two scenarios that have been particularly prevalent for defining cleanup scenarios. The Industrial Worker is a standard scenario from the Model Toxics Control Act (MTCA) and EPA guidance. The Subsistence Farmer scenario is unique to the Hanford Site.

Larry said the remedies should be at least as clean as the interim actions. MTCA B is the state regulation that covers chemical contaminants. Jim said MTCA B does not sum different pathways, such as inhalation versus direct contact. The pathways are considered independently. There is a difference between CERCLA and MTCA methodologies on the limits for cumulative and additive risks. These two methodologies are very different and neither is better than the other.

Jim described the RCBRA Ecological Risk Assessment (ERA). He said animals can be more or less sensitive to certain chemicals depending on their diet so the ERA considered a variety of feeding guilds. There are two tiers that are considered: the first considered site-specific species and the second site-specific food.

Larry described each of the columns from Table 8-3: Summary of 100-K Operable Unit Human Health, Groundwater Protection, Surface Water Protection, and Ecological Soil preliminary remediation goals (PRGs) (Attachment 4: Table 8.3). The numbers on the table under Ecological PRGs represent the most sensitive species. The Human Health PRGs include the numbers that would be protective of the individuals under the listed scenario.

Committee Questions and Response

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

Q: What is a hazard quotient?

> *R: A hazard quotient is the amount of a toxic substance required before exhibiting some negative effective, such as liver damage or an acute illness that is not cancer-related.*

Q: What if contaminants exceed acceptable levels below 15 feet?

> *R: We always consider groundwater protectiveness. If contamination is found below 15 feet we may use institutional controls to protect people from direct contact.*

Q: Would it be correct to say that Tier 1 levels are based on a bird's diet of earthworms, even though the birds on site may not be eating earthworms?

> *R: Tier 1 is not adjusted. Tier 1 represents model values that assume certain prey items are living in the soil and that the expected concentration of earthworms are consumed by birds. These assumptions can be combined with fieldwork to determine what the birds are actually ingesting.*

C: It seems like Tier 2 would be more accurate unless there is not enough data. Are there any indications of where there is high uncertainty with the data?

> *R: The document does identify the level of uncertainty. DOE is trying to be as transparent as possible with highly technical information. Confidence is not calculated as a percentage. Values of low, medium or high are assigned. Any number with a low confidence level would not appear on a chart.*

C: The preliminary PRG chosen was the highest 'no effect' concentration value. If DOE does not support the methodology used in Tier 1 and Tier 2, did you take the time to evaluate the difference between using the 'no effect' versus using the 'low effect'?

R: We did look at the low effect. The number would be significantly higher for some contaminants when using a more conservative approach.

Q: What scale do you use for measuring irrigation?

R: The assumption is 30 inches per year of irrigation across the entire waste site in addition to six inches of annual rainfall. A net nine percent of those 36 inches is assumed to move through the soil and into groundwater.

Q: Is the geographical scale by waste site?

R: The scale is the entire waste site.

Q: What would the difference be if the scale was different?

R: We could use ratios by estimating the size of people's gardens. It is hard to make that type of estimates, but it would allow for decisions to be scaled.

C: The more useful potential for irrigation might be for re-vegetation and maintaining the current flora and fauna. Irrigation used for vegetation would differ over the long-term.

R: DOE proposed screening sites based on irrigation scenarios. In the original draft there is a PRG based on no irrigation. DOE is currently in discussions with EPA and the Washington State Department of Ecology (Ecology) on irrigation. The issue is currently unresolved. I am not aware of any current irrigation activities on restoration sites.

There has been re-vegetation on some sites to restore the natural habitat. If those sites are irrigated invasive species and weeds tend to move in. Native plants survive better when they are not irrigated.

Q: Will the mercury be cleaned up to a level of .03 mg/kg?

R: The lowest value is .03 mg/kg of mercury for the ecological receptors. Typically, the actions for ecological risk are protective of populations. The killdeer is the most sensitive species of bird to mercury. The home range of a killdeer is ten acres, which is the area they feed off of. Exposure scenarios assume the killdeer uses 100% of its resources from the waste site. The size of the waste site does not matter. Size matters for ecological exposure. For instance, the home range of a badger is a couple of square miles. Badgers are the most

sensitive receptor to uranium. Waste sites that are a quarter of an acre exceed the badger's home range. It is important to understand how much of the waste site is used by badgers and the amount of prey badgers obtain from the waste site itself. Assuming that the badger only consumes prey that lives entirely on a waste site would probably be unreasonable. This is when discussion with regulators and decision-makers become important.

Q: How is the tribal scenario related to the most conservative scenario?

R: The tribal scenario is consistent with the more conservative scenarios.

C: Given the number of factors and variables, it seems like there will be a lot of questions from the public if you say that for the foreseeable future people cannot dig below 15 feet instead of beginning a basis for cleanup action.

R: It is important to consider what the overall magnitude of exposure would be. The Subsistence Farmer scenario considers risks from 30 years of exposure. This scenario includes risks from dust inhalation, external radiation, eating plants and animals grown exclusively on the waste site, etc. Consider the PRGs under this scenario and the difference between a residential and recreational user. A recreational user is assumed to spend 40 days a year on the site. From this perspective, it is easier to understand how conservative the estimates really are compared to someone whose entire basis of exposure would be if they dug more than 15 feet under the surface.

Q: How arbitrary is it to stop 15 feet below the surface when the contamination is so close to the Columbia River?

R: 15 feet is the state law for direct contact exposures under unrestricted use scenarios. 15 feet is a relatively extensive cleanup compared to other sites.

C: There are ambiguous areas in the RA documents and these documents are not available for comment. One comment would be about the Columbia River Component of the Tier 1/Tier 2 approaches. The RCBRA has improved a lot, but there are still major problems and concerns. We did get an understanding of where some of the cleanup values originate from in Table 8.3 that will become part of the final ROD. Will the numbers on Table 8.3 that are highlighted in yellow be used as the cleanup values?

R: EPA, Ecology, and DOE are still discussing irrigation. Those discussions will all affect the groundwater protection values. The remaining cleanup values are fairly certain, but have not been finalized yet.

Q: What do the Tri-Party Agreement (TPA) agencies need from the Board?

R: As we've moved through the process there are many elements that may or may not be policy-level issues. It would be useful to have the Board's input on irrigation and land use. DOE is using a Rural Residential scenario. Also, the 100 K Proposed Plan (Draft A) does not include anything about groundwater. Chromium in the deep vadose zone is another issue the Board could comment on. There are questions about how to remediate chromium. Should it be flushed into groundwater and caught through bioreduction? What options does the Board like and what options does it not like? The Board can consider different elements from Alternatives Two and Three (100 K Proposed Plan – Draft A) instead of only looking at the entire package. There are also policy-issues for the Board to comment on regarding arsenic in orchard lands.

C: Groundwater is another big issue and the modeling being used. Regulatory agencies agreed on using Subsurface Transport Over Multiple Phases (STOMP) in the Vadose zone, but did not agree to the model parameters.

R: STOMP is used for modeling groundwater and the vadose zone. There are other models used for different groundwater aspects.

The committee discussed next steps for the River Corridor Cleanup topic. Before discussing this topic at another committee meeting, the IMs will discuss the potential technical and policy issues to help identify where the Board should focus its input on River Corridor cleanup issues.

Draft A, 100-K Proposed Plan

Issue manager perspectives

Dale introduced the next meeting agenda topic, 100 K Proposed Plan, Draft A (Proposed Plan). He reminded everyone that at the December committee meeting, RAP began identifying advice points on what RAP and the Board thought about the current approach outlined in the Proposed Plan. The agency representatives presenting at the December meeting said the recommendations in the advice points were already under discussion among the TPA agencies. The purpose of today's discussion is to obtain a better understanding of where DOE is now and to discuss possible next steps towards advice.

Agency perspectives

Jim said DOE initially presented the RI/FS and Proposed Plan in October. Through discussions with regulators, the original proposal has morphed and there is now more solid information to share. Jim said he would discuss the differences between Alternatives Two and Three (Attachment 5: Comparison table of Alternatives Two and Three for the 100-K River Corridor

Cleanup; Attachment 6: Preferred Remedy: Alternative 2 – RTD & GW P&T Optimized with Other Technologies; Attachment 7: Other Remedial Alternatives).

Jim said the proposal in Alternative Two is essentially a continuation of the processes currently being implemented – remove, treat, dispose (RTD) and groundwater pump and treat optimized with other technologies. Alternative Two will take longer since pump-and-treat is expected to operate until 2037. Alternative Three uses RTD focused on aggressive groundwater treatment through pump and treat. This means a lot more wells would be placed in locations where there are a number of cultural sensitivities.

Regulator perspectives

Chris Guzzetti, EPA, said the current Proposed Plan is different from the original plan. EPA asked DOE to examine each waste site and determine where they plan to use each alternative. There is additional information in this plan.

Committee Questions and Response

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

Q: Is 62 the total number of waste sites?

R: The total number of waste sites in the 100 K area is 165. Of those waste sites, 37 were closed, not accepted or rejected. That leaves 128 waste site. Neither Jim Hansen, DOE-RL, or Jim Hanson, DOE-RL, know to what the 45 number refers.

Q: What is the total number of waste sites in the 100-K Area?

R: There are 165 waste sites. Of those, 37 sites were closed, not accepted or rejected. Of the remaining 128 sites: 12 were remediated, 50 will be cleaned up under the interim action ROD and 66 will be cleaned up under the final ROD.[1]

Q: What is the cost difference between Alternatives Two and Three?

R: About $50 million. However, Alternative Two has higher maintenance costs than Alternative Three. Those costs should be included in the lifecycle cost.

Q: Have there been discussions with the tribes regarding some of the cultural issues mentioned in the presentation? It appears that Alternative 3 might not be viable because of these cultural

[1] Attachment 5 should read "12 remediated" instead of "16 remediated."

considerations (resulting from the extent of excavation in sensitive areas), so is it worthwhile to even consider it?

R: There have been discussions with the tribes starting two months ago. Historically, wells were placed along the river and in culturally sensitive areas. Access to these areas can become a challenge. Talks are progressing, although there are some challenging spots.

C: In the previous discussion, the IMs compared Alternative Two versus Alternative Three. From agency comments today, three now appears to be echoing what Alternative Two looked like in the Proposed Plan.

R: The RTD component has been refined for PRGs. We had to find specific locations within a table, which became a very large document so we tried to consolidate the information and put it in one location to make it comprehensible.

C: The perfect solution might be a hybrid between the two alternatives by moving ahead with RTD and expanding pump and treat where there would likely be the greatest benefit. One of the concerns with Alternative Three is the amount of wells required, especially in culturally sensitive areas. With a combination of Alternatives Two and Three, it is possible to begin work now, even if proven technologies are not available. Many technologies need to go through testing before being used, which can take months or years. There is a delay built into the planning in order to show that technologies can work on a practical basis. RTD has proven to work well.

C: There are some aspects that are not addressed at all in the documents. The treatment of strontium is different than treatment for chromium, which requires a new pump-and-treat technology for the plant.

R: The concentrations associated with other contaminants are relatively low. By the time water is extracted from the aquifer and has gone through pump and treat, the concentration is already below drinking water standards.

C: Water that contains those contaminants would still be pumped back into the ground.

R: That is acceptable as long as contaminants remain below drinking water standards.

C: 100 K in particular has been problematic because of past K Basin leaks. The workplan (RI/FS) does not address contaminants of concern under the K Basin reactor. Contaminants such as uranium and americium are fuel-based. We do not know if the agencies have determined if there is a plume under the reactor.

R: The basin work has been ongoing and moving forward more recently. The main constituents 45 feet below the ground surface are strontium, cesium and carbon-14. That information has not been pulled into the RI/FS as it currently stands. It is a component of the existing interim actions. There is a concern about undermining the structural integrity of the reactors in the K-East and K-West locations. Going to continue to sample, will backfill and place a cap over the surface that will remain until the reactor can be addressed in the future.

Q: Are these factors that must be dealt with later noted anywhere?

R: Areas that need additional work are noted in the RI/FS.

C: Pump and treat could be used to treat and capture as much waste as possible right now. Then alternative technologies can be used where pump and treat is not possible.

C: RAP previously discussed advice stating they preferred the performance of Alternative Three compared to Alternative Two because Alternative Three can be implemented immediately. The real preference would be for a hybrid between the two alternatives.

C: Other technologies have not been proven viable for the Hanford Site. The advice should address these concerns and the other concerns brought up during the discussion. Part of the advice could request a workshop that discusses the documents. The Board was told there would be a workshop last August. Everything written in this plan is based on a document that is unapproved. The Board should definitely offer advice on the issue since the 100 K Site will serve as a prototype of every other ROD for the Hanford Site. These are the documents that will support the ultimate cleanup decisions.

C: Considering this document is a template for future RODs, the Board should get a process in place for receiving these plans and understanding the overarching policy-level issues. Irrigation is one of these issues. Another is land use scenarios.

C: The only difference is the treatment of chromium-6. Alternative Three only uses pump and treat while Alternative Two uses other technologies, which will require development time. DOE should move forward with the work that is possible now and also carry out the development of technologies.

R: The rumor that these technologies require massive scientific development is not true. One of the main technologies DOE is advocating is the use of soil flushing through the vadose zone. DOE must ensure there is adequate contaminant capture through the groundwater. Groundwater is not the only aspect being considered. The goals for groundwater remediation will not be achieved unless the persistent sources of contamination are removed

from within the vadose zone. DOE is also considering other alternatives within the vadose zone that may be able to more adequately remediate groundwater.

C: The Board believes very strongly in doing no further harm. Until the risks of soil flushing are better understand and there is more confidence in the ability to control the system, the Board might want to consider whether it would support such a technology. Alternative technologies should not be used until they are proven.

C: The advice can state there are general concerns about the proposed plan. The Board would prefer a hybrid or possibly another alternative entirely. There are concerns beyond soil flushing.

C: A major issue is that all these documents have been given to the Board after choices have already been made. The Board's advice should be general and high level, because we have been asked for specific comments. The Proposed Plan uses alternatives based on land use scenarios in the RI/FS. The Board has been asked to comment on those.

R: EPA has estimated land use scenarios into the next 200 years. The assumption is that since there are farms in the surrounding areas today, there will be farms in the future. Farming is where the question of irrigation becomes very important. What does the Board think about future anticipated land use? DOE is using the Comprehensive Land Use Plan as their land-use document.

C: The IMs can draft possible advice points on irrigation and land use to determine whether consensus is possible. The Board has offered advice on land use in the past, but not on irrigation.

C: It is important to offer advice on this topic to establish a precedent that the Board will be commenting on proposed plans. This will set a framework for the future. DOE might interpret absence of advice from the Board as acceptance of using the same strategy in the future.

The committee decided to develop advice on timely issues in February and develop other advice in the future for those issues that are not time sensitive. The IMs will work on draft advice and it will be vetted through the committee through email. The next draft will be available for committee review by January 20.

Committee Business

The committee decided to hold a call on Wednesday, January 18 at 1:00 p.m. Susan Hayman will check with agency liaisons to be sure this time works for them, as this is a departure from the usual committee call placeholder. The committee also discussed possibly changing the placeholder time for the monthly RAP call. The 6-month work plan and February meeting topics table will be the focus of the January 18 committee call.

Susan Hayman reviewed follow-up items for the committee, including:

1. Request the agencies convene a workshop /discussion ("deep dive") about plutonium mobility.
2. DOE will post their point by point response to HAB Advice 247on the HAB website.
3. IMs will revise the PW 1,3,6/CW-5 ROD draft letter; Susan H. will distribute this for committee review by 1/17.
4. IMs for River Corridor will meet to discuss policy level priorities/approaches & committee next steps.
5. Jean Vanni will check DOE's 100 K Alternative images to see if they can be clearly viewed by enlarging the PDFs, or if there is a need to ask DOE to provide higher resolution images.
6. IMs will draft 100 K advice, and Susan H. will distribute this for committee review by 1/20.

Attachments

Attachment 1: Drat HAB Letter Regarding the PW-1,3,6/CW-5 Record of Decision
Attachment 2: Draft RAP email submittals regarding the development of the PW-1,3,6/CW-5 work plan
Attachment 3: Risk Assessment in the RI/FS Process and Derivation of Cleanup Levels
Attachment 4: Table 8.3: Summary of 100-K Operable Unit Human Health, Groundwater Protection, Surface Water Protection, and Ecological Soil PRGs
Attachment 5: Comparison table of Alternatives Two and Three for the 100-K River Corridor Cleanup
Attachment 6: Preferred Remedy: Alternative 2 – RTD & GW P&T Optimized with Other Technologies
Attachment 7: Other Remedial Alternatives
Attachment 8: RAP 6 month work plan

Attendees

HAB Members and Alternates

Shelley Cimon	Doug Mercer (phone)	Dick Smith
Dale Engstrom	Ken Niles (phone)	John Stanfill
John Howieson	Vince Panesko	Bob Suyama
Steve Hudson	Jerry Peltier	Gene Van Liew
Pam Larsen	Maynard Plahuta	Jean Vanni
Susan Leckband	Wade Riggsbee	Steve White
Liz Mattson	Dan Serres	Dave Rowland

Others

Paula Call, DOE-RL	Dieter Bohrmann, Ecology	Peggy Hiam, Benton City
JD Dowell, DOE-RL	Madeleine Brown, Ecology	Ron Brunke, CHPRC
Jim Hansen, DOE-RL	Dib Goswami, Ecology	Moses Jaraysi, CHPRC
John Neath, DOE-RL	Brenda Jentzen, Ecology	Dale McKenney CHPRC
Tifany Nguyen, DOE-RL	Nina Menard, Ecology	Ted Repasky, CTUIR
Greg Sinton, DOE-RL	Larry Gadbois, EPA	Mike Priddy, DOH
	Chris Guzzetti, EPA	Nicole Addington, EnviroIssues
	Emy Laija, EPA	Susan Hayman, EnviroIssues
		Jessica Ruehrwein, EnviroIssues
		Sharon Braswell, MSA (phone)
		Sonya Johnson, CHRPRC
		Reed Kaldor, MSA
		Barb Wise, MSA
		Bruce Ford, Public
		Ed Revell, Public
		Peter Bengtson, WCH
		Richard Bloom, West Richland, Public