



Many Voices Working for the Community

Oak Ridge Site Specific Advisory Board

Approved June 10, 2015 Meeting Minutes

The Oak Ridge Site Specific Advisory Board (ORSSAB) held its monthly meeting on Wednesday, June 10, 2015, at the DOE Information Center, 1 Science.gov Way, Oak Ridge, Tenn., beginning at 6 p.m. A video of the meeting was made and may be viewed by contacting ORSSAB support offices at (865) 241-4583 or 241-4584. The presentation portion of the video is available on the board's YouTube site at www.youtube.com/user/ORSSAB/videos.

Members Present

Leon Baker
Jimmy Bell
Alfreda Cook
Lisa Hagy, Secretary
Bob Hatcher
David Hemelright, Chair

Howard Holmes
Jennifer Kasten
Terri Likens
Fay Martin
Donald Mei
Greg Paulus

Mary Smalling¹
Coralie Staley
Scott Stout
Ed Trujillo
Wanfang Zhou

Members Absent

Jan Lyons, Vice Chair
Belinda Price

¹Participated by telephone hookup.

Liaisons, Deputy Designated Federal Officer, and Federal Coordinator Present

Dave Adler, ORSSAB Alternate Deputy Designated Federal Officer
Kristof Czartoryski, Tennessee Department of Environment and Conservation (TDEC)
Susan Cange, Manager for Oak Ridge Environmental Management (EM) and ORSSAB Deputy Designated Federal Officer
Melyssa Noe, ORSSAB Federal Coordinator, Department of Energy – Oak Ridge Office (DOE-ORO)
Connie Jones, Environmental Protection Agency (EPA) Region 4.

Others Present

Steve Cooke, DOE
Sophia Cui, Student Representative
Steve Haase, RSI
Alana Joldersma, Student Representative
David Martin, chair Roane County Commission Environmental Review Board.
Bill McMillan, DOE
Pete Osborne, ORSSAB Support Office
Ellen Smith, Oak Ridge City Council

Twenty-two members of the public were present.

Liaison Comments

Ms. Cange – On Friday, June 26 there will be a celebration of the completion of demolition of the K-31 Gaseous Diffusion Building at East Tennessee Technology Park (ETTP). Mark Whitney, the Acting Assistant Secretary for Environmental Management (EM) will be participating. He will be speaking at the East Tennessee Economics Council at 7:30 a.m. Afterwards a bus will be available to transport people to ETTP. Ms. Cange invited board members to attend the celebration at ETTP and advised them to contact Ms. Noe or ORSSAB staff if they would like to attend.

K-27 is the only remaining gaseous diffusion building at ETTP. Ms. Cange said that building demolition should be completed by the end of 2016.

Mr. Adler – no comments.

Ms. Jones – no comments.

Mr. Czartoryski – no comments.

Public Comment

Mr. Martin commended ORSSAB and DOE EM for publicizing this meeting regarding the status of the groundwater strategy for the Oak Ridge Reservation (ORR). Mr. Martin said the Roane County Commission Environmental Review Board meets the first Thursday of every month at 6 p.m. at the Roane County Courthouse except in July and December. More information about the board is available at <http://roanecountyttn.gov/county-commission/boards-and-commissions/environmental-review-board/>.

Presentation

The presentation was on the ORR Groundwater Strategy Status. The presenters were Mr. McMillan, Mr. Cooke, and Mr. Haase. The main points of the presentation are in Attachment 1.

Mr. McMillan began by saying that prior to 2013 there was evidence in monitoring wells around the ORR of possible migration of contaminants. DOE, EPA, and TDEC decided to conduct a series of workshops to better understand groundwater characteristics on the ORR and develop a strategy for groundwater management.

Six workshops were held in 2013, and all of the available information about groundwater plumes associated with the three watersheds on the ORR was compiled. The information was used to develop a modified hazard ranking system to rank the plumes and possible associated projects. A groundwater strategy was developed to implement a path forward for managing groundwater challenges (Attachment 1, page 3).

Mr. McMillan said the objective of the strategy is to support decision making and identify actions to protect off-site human health and the environment; protect groundwater; restore to beneficial use where practicable; and achieve final cleanup (Attachment 1, page 3).

Using the hazard ranking system 35 plumes on the ORR were identified as having contaminants of concern at depths of 100 to 400 feet (Attachment 1, page 4). Thirty-six projects were defined that focus on additional investigations to fill data gaps, conducting any early actions, or identifying other projects based on findings. To manage the work Mr. McMillan said a program was set up to implement the strategy to prioritize and investigate plumes and data gaps, identify any actions that may be needed, and incorporate those actions into cleanup decisions. The first priority was to

perform an off-site groundwater assessment to address potential for off-site risk. The off-site assessment was identified as part of the “Melton Valley Exit Pathway from Undetermined Sources” project in the groundwater strategy. Mr. McMillan said this project had the highest potential for off-site migration. The study is evaluating the potential for migration from Melton Valley to areas west of the Clinch River. A final report on the assessment is due the first quarter of FY 2017. Mr. McMillan said any subsequent projects will be determined by the outcome of the first project. Mr. McMillan also said that a regional flow model is being developed as an action conducted as part of the implementation of the groundwater strategy. The model is being developed by an independent team of experts in karst geohydrology.

Mr. Cooke provided further information about the offsite groundwater assessment. Mr. Cooke said DOE, EPA, and TDEC developed a Remedial Site Evaluation Work Plan for the off-site assessment. The purpose was to determine if there are hazardous substances in off-site groundwater, if they are related to ORR plumes, if any health threat is associated with them, and if any DOE action is required. In the fall of 2014 DOE began talking with property owners at locations west of the Clinch River with potential for sampling. Agreements were made with a number of owners and sampling began in the winter. Mr. Cooke said 43 locations were sampled, 32 wells and 11 springs (Attachment 1, page 11). Another sampling of these same locations is scheduled for this summer.

Three of the sites exceeded EPA National Primary Drinking Water Standards. Exceeded levels were found for lead at one location, lead and gross alpha activity at another (that location was re-sampled in April with no indication of gross alpha activity), and combined radium-226 and radium-228 at the third (Attachment 1, page 12). Mr. Cooke said there were other detections at very low levels, and the team is trying to understand if those detections are associated with naturally occurring radon or other background constituents. He said that DOE, TDEC, and TDH are evaluating the screening data, and that this analysis process will help inform the implementation of the next steps in the groundwater strategy.

Mr. Cooke said a communications matrix has been developed to share information among agencies (DOE/TDEC/TDH) and the public (Attachment 1, page 13).

Another part of the groundwater strategy is the development of a groundwater model for the ORR. Mr. Haase said the model would be a “powerful tool for planning and decision making.”

The model will be used on a regional scale to investigate groundwater conditions in the area of the ORR. Mr. Haase said the model is in its first stages, but will ultimately serve as an excellent platform to answer ‘what if’ questions and to address site specific questions as remediation decisions are evaluated (Attachment 1, page14).

A model area has been identified that encompasses much of the ORR, an area of 250 square miles (Attachment 1, page 16). A software program called Earth Vision has been selected to develop the model. Mr. Haase said one of the most difficult things in Oak Ridge is getting a handle on the complex geology of the area. Earth Vision uses data collected over 40 years to visualize and develop layers, which can be put into the groundwater model.

Also being used is a U.S. Geological Survey numeric flow model called MODFLOW-USG. Mr. Haase said MODFLOW is an industry standard for groundwater modeling. The most recent version, MODFLOW-USG, provides the capability of dealing with complex geology. Mr. Haase said Oak Ridge is one of the first sites in the world to use MODFLOW-USG with a geology as complex as Oak Ridge.

The modelling team evaluated the integration between MODFLOW-USG and Earth Vision. A test case was done using the geology of Y-12 National Security Complex and Bear Creek Valley, which has a large amount of available geologic data. The test was successful, and the model has been expanded to the 250-square mile modeling area. The steps in developing the model are illustrated on pages 17-19 of Attachment 1.

Mr. Haase said a working model will provide a good basis for modeling groundwater through a number of scenarios. It can be used to help place off-site monitoring locations and evaluate various options of the kinds of remedial actions to take.

Mr. McMillan concluded the presentation saying the next steps include an FY 2018 milestone for the Remedial Investigation Work Plan. The milestone is a placeholder for the next priority project to be determined, such as a project to install or sample existing wells in Melton Valley or Bear Creek Valley to better understand contaminant plumes and reduce data gaps. Other possible projects are addressing groundwater issues in the hydrofracture area of Melton Valley, the ETTP Sitewide Treatability Study, and the Bethel Valley 7000 area (Attachment 1, page 20). He said the selection of the project will be developed by DOE, EPA, and TDEC, will depend on the results of off-site assessments and plume rankings.

Mr. McMillan said the activity with the modeling effort, the groundwater plumes, and the understanding and filling of data gaps is all driven to support early actions and to develop strategies for incorporating final records of decision for cleanup of the ORR.

A summary of the progress of the groundwater strategy is reported annually in the Remediation Effectiveness Report.

After the presentation a number of questions were asked. Following are abridged questions and answers.

Mr. Bell – You have not proven any release of radioactivity off-site. You've had indications at one time and not another. To prove it you're going to have to get repeated indications. Mr. Cooke – We have detected radionuclides at very low levels. This is partly a research project using very low detection levels. When you do that you're going to pick up things. We're trying to figure out what the source is. Mr. Bell – The objective is to determine if you have an off-site release and your data do not show you have an off-site release because you have to get repeated indications. So how do you respond to a land owner about your data? Mr. McMillan – We're not saying we have any final data. What we did want to do with the property owners was to give them some feedback on the samples taken initially, and we're continuing the study with another round of sampling this summer and another round of sampling in FY 2016 to see if the readings are repeated. We felt obligated to give landowners some feedback, which is based on whether their health is being impacted. TDEC and the Tennessee Department of Health are helping us with that communication. Mr. Bell – Are concerned about causing alarm among landowners? Mr. Haase – As mentioned the readings are quite low, in some cases lower than what is required to be reported by regulatory monitoring. One of the reasons we're doing that is to look at the leading edge of something we might be finding. One of disadvantages, especially with radionuclides, is you're down in the area above detection limits, but below the limit you can quantify with 90 percent or more certainty. One way to evaluate that is with repeat sampling. They may be the leading edge of contamination from the ORR; it may be fallout. That's something that is not well understand is the amount of fallout during the testing period.

Mr. Bell – Should you determine there is an off-site release what will DOE do? Ms. Cange – The first thing we have to do is to determine if it's coming from the ORR. There is the possibility that

there can be detections of radionuclides that come from radon or from naturally occurring constituents in the environment. If there is something coming from the ORR that exceeds health limits, we'll consult with the Tennessee Department of Health and determine the proper actions regarding someone's well water. Remember that a number of our sampling locations are seeps and not water that is used by residents.

Mr. Czartoryski – TDEC has established that contamination has moved under the Clinch River. We are looking at preliminary data of the off-site effort. DOE is looking at very small amounts of transuranics. Transuranics are not naturally occurring elements. It's too early to make any conclusions. We also are looking at some fission products. We're looking at some naturally occurring radionuclides that could also be daughters of the radioactivity disposed on the other side of the river. Hydrofracture disposed a lot of radioactivity very deep at levels that can travel under the Clinch River. They will not necessarily appear in surface water. Due to the very complicated hydrogeology with the springs, dry seasons, wet seasons, and so on, we might find something in samples that we might not find the next time we sample. To answer the question about what DOE would do I can only say what the state of Tennessee does. Our health department contacts residents when we have indications that primary drinking water maximum contaminant limits are exceeded, we advise residents about securing different sources of drinking water. So there is a benefit of this process. It's too early to say potentially how far a plume may travel from the ORR. We know that the plume in Melton Valley has already passed the picket wells there. So there is no other place for picket wells except on the west side of the river. DOE has already purchased water rights from some residents, and water was provided to some residents whose water sources were deemed unsafe. The state is not only concerned about current risk, but future risk to residents.

Mr. Hatcher – Why in your sampling when you recorded a null set you didn't go back and immediately re-sample until you got a representative sample? Mr. Haase – The hydrogeologic area has a dry season and wet season. You can have appreciable concentration differences, especially in surface water, depending on the season. The initial puzzle to solve was how to get the best data for the best value. We focused on getting a dry season round of samples and then a wet season. In the case of the well that showed alpha activity, we re-sampled it immediately, and it turns out that well has radon in it. Now that we know what to look for about half of the wells sampled have radon in them. If we have something above maximum contaminant limits we would re-sample immediately; if not we'd wait and see what we got in the dry season.

Ms. Kasten – Have you looked at it from the standpoint of short-lived daughter products that can be used that maybe are coming from a source of a long-lived parent and use it as a way to try to understand the flow paths of contamination? Mr. Haase – That's exactly what we're doing with the radon example. The daughters that we see and couldn't explain before we realized there was radon are an isotope of bismuth and an isotope of lead that have 20 minute half-lives. By paying attention to when the analyses were collected, when they analyzed, and looking at what appears and disappears due to radioactive activity we can get some idea of at least where the connections are within the different parts of the aquifer. Ms. Kasten – What is the potential movement of uranium from hydrofracture that there might be some short-lived daughter products that may be moving from that area? Mr. Haase – The issue with hydrofracture is that it is so deep and we have so few sampling points to get down to the water that's around it. With the level of data we've collected we don't see that happening, but a lot of the nuclides injected into the hydrofracture have quite long half-lives. So it takes a while for the daughters to kick in. It depends on where they are in the decay chain. But to answer your question, yes, we're trying to use all the tricks we can come up with to figure out what's going on.

Mr. Burroughs – I wonder if you’ve collected any background data with this cutting edge technique. Mr. Czartoryski – We have a project of collecting background data that we have not initiated yet but will begin soon.

Mr. Trujillo – The wells and springs that were sampled, did they have any association with on-site contamination? Mr. Haase – We had about 100 potential sampling locations. We looked at them in terms of what we understood about the construction and depths of the wells. We stayed away from wells less than 20 feet deep. We wanted wells down in the bedrock. Some people didn’t want their wells sampled. We tried to select on depth and location. It’s a matter of making the best choices we can with the available choices to choose from.

Mr. Trujillo – There is the sampling effort and the modeling effort. What feeds what? Mr. Haase – We have water level maps that show what the surface configuration of the water table is. We can use that information for some insight as to where we want to find wells to sample. The issue is when you get deeper because the heads that drive water levels in the deeper wells are not related to the surface. In the picket wells we measure the heads in each well and you can work out whether there is an upward gradient or a downward gradient. You can’t do that with just one well. But wells are expensive to drill. This is where we hope the model will give some insight as to what kind of hydrogeologic conditions to expect.

Mr. Zhou – A question about modeling. On one of your slides you show the model domain, which is a rectangle. What is the rationale behind that decision? Mr. Haase – We try to balance getting an area as big as we thought we could extrapolate the existing data. When you’re out on the edge of that rectangle there are very few data points. We have to make a huge extrapolation. That’s going to be a problem for our model. For most of the plumes we have data that we can do better quality monitoring. When we picked that area we tried to balance how far we felt comfortable pushing the data and how big of an area we thought we could get in. Some of the areas we’re writing off as no flow boundaries. We are not going to model them even though they are within the rectangle because we have no data. Mr. Zhou – So in those areas of little data you’re going to have to extrapolate back. How accurate is that going to be? Mr. Haase – At least with the test case we have enough data that we can begin to do some calibrations. In other words we can check water levels and we can check flows. The calibrations so far are good. When we get away from that, that’s one of the problems of the far edges of the domain; there are very few places we can calibrate and check the model. The model at that point becomes a numerical experiment. You can use it to evaluate plausible scenarios and see if it can give you some insight as to which one may be the most plausible.

Mr. Paulus – Are there any specific contaminants that you are more concerned with off-site? Mr. Haase – In the initial CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) actions for Oak Ridge sites a list of contaminants of concern was identified so we focus on those, but the list is quite large. There are some signature contaminants like nitrates, uranium, strontium, cesium; those are some of the major constituents. If we see nitrates and uranium together that takes precedence that we’re looking at something from Y-12.

Ms. Smith – Are wells installed by DOE on the west side of the river still being sampled and can they be used for a rigorous program for evaluating what is potentially moving so we can gain some scientific value from that work? Mr. Adler – They are still being sampled. It is a collection of wells drilled to four separate depths. They are up and out of the river valley. The purpose was to get a handle on which direction groundwater flows. There were two wells where we went to property owners wells and modified them (with their permission) to make them more useful for us for monitoring purposes. So we have a collection of wells. Some drilled with the purpose of high quality monitoring and another set that are not quite as good because they were drilled for drinking

water supply. So we sample and learn what we can from that combination of wells. Ms. Smith – We are trying to understand what’s happening on the other side of the river. A high priority should be placed on a systematic collection of data. The monitoring may go on for years and still may not have basis for making decisions.

Ms. Smith – I was pleased to hear the validation of the model in the Y-12 area. Is that validation limited to steady state groundwater flow parameters or you can move on to anything else? What are the plans for moving on? Mr. Haase – Right now it is steady state. As the situation evolves I can see where we’ll have to go into transient conditions, but that is not something we’re working on now. We’re trying to get the best job done for something we can use to set baseline conditions.

Committee Reports

EM & Stewardship – Ms. Staley reported that the committee met on May 20 and agreed on the draft recommendation on the DOE Oak Ridge EM FY 2017 Budget Request that was passed at this meeting (Attachment 2, see Announcements).

There was a follow up discussion on the May 13 ORSSAB meeting with Oak Ridge City Manager Mark Watson. The committee did not take any action on that meeting.

The committee will meet again on June 17 and have a follow up discussion on the ORR Groundwater Strategy discussed at this meeting.

Executive – Mr. Hemelright said the committee met on May 27 and also discussed the May 13 ORSSAB meeting with Mr. Watson. Mr. Hemelright said the takeaway message of the meeting was that while there may be better sites for waste disposal in the western United States there are other considerations of risk in transportation and cost.

The committee reviewed the draft recommendation on the DOE Oak Ridge EM FY 2017 Budget Request (Attachment 2) and approved it to go before the board for consideration at this meeting.

Mr. Hemelright reported that the Earth Day celebration went well and many people visited the ORSSAB exhibit.

The committee approved some travel requests for the Fall EM SSAB Chairs’ meeting and the EPA Community Involvement Training Conference. ORSSAB will host the Spring 2016 Chairs’ meeting. Mr. Hemelright said he’d like to see a presentation on the Land Use Manager made at that meeting.

The ORSSAB annual meeting will be held August 22 at the Tremont Lodge in Townsend, Tenn. There will be a Friday evening get together as well. Jenny Freeman will facilitate the meeting.

Ms. Staley reported on the Center for Oak Ridge Oral History. She said it appears the grant to continue gathering oral histories will be renewed.

She has been the ORSSAB representative on the center’s board for three years. She said she is willing to continue, but if any other member is interested in the position she would relinquish. The center meets monthly on Thursday at 9 a.m.

Announcements and Other Board Business

ORSSAB’s next scheduled meeting will be its Annual Planning Meeting on Saturday, August 22, at the Tremont Lodge in Townsend, Tenn.

Ms. Joldersma and Ms. Cui were introduced as the new student representatives to the board.

Mr. Bell and Ms. Martin were recognized for their service to the board.

The minutes of the February 11 meeting were approved.

The minutes of the March 11 meeting were approved.

The minutes of the May 13 meeting were approved.

The Recommendation of the FY 2017 DOE Oak Ridge EM Budget Request was approved (Attachment 2).

The EM SSAB Recommendation on the Creation of a Plan and Timetable to Restore the Waste Isolation Pilot Plant to Safe Operations was approved (Attachment 3).

Federal Coordinator Report

Ms. Noe said three new members have been approved to begin their terms in July.

Motions

6/10/15.1

Mr. Paulus moved to approve the minutes of the February 11 meeting. Mr. Baker seconded and motion passed **unanimously**.

6/10/15.2

Mr. Paulus moved to approve the minutes of the March 11 meeting. Ms. Likens seconded and the motion passed unanimously.

6/10/15.3

Mr. Baker moved to approve the minutes of the May 13 meeting. Mr. Paulus seconded and the motion passed **unanimously**.

6/10/15.4

Mr. Hatcher moved to approve the Recommendation on the FY 2017 DOE Oak Ridge EM Budget Request. Ms. Cook seconded and the motion passed **unanimously**.

6/10/15.5

Mr. Hatcher moved to approve the EM SSAB Recommendation on the Waste Isolation Pilot Plant. Ms. Martin seconded and the motion passed **unanimously**.

6/10/15.6

Mr. Hemelright asked for volunteers for a Nominating Committee to secure nominees for board officers for FY 2016. Ms. Price had indicated earlier she would be willing to serve. Ms. Smalling indicated she would be willing to serve. There were no other volunteers. Mr. Hatcher moved to approve Ms. Price and Ms. Smalling as the Nominating Committee. Ms. Hagy seconded and the motion passed **unanimously**.

Action items

None.

The meeting adjourned at 8:07 p.m.

Attachments (3) to these minutes are available on request from the ORSSAB support office.

I certify that these minutes are an accurate account of the June 10, 2015, meeting of the Oak Ridge Site Specific Advisory Board.

Dave Hemelright

Dave Hemelright, Chair
Oak Ridge Site Specific Advisory Board
DH/rsg

September 10, 2015