

MINUTES
NAVAL WEAPONS STATION (NAVWPNSTA) SEAL BEACH
RESTORATION ADVISORY BOARD (RAB)
AND COMMUNITY MEETING
City of Seal Beach Council Chambers
January 11, 2012

Participants:

Blake, Geoffrey/RAB Community Member
Gandara, Jose /RAB Community Member
Jordan, Jack/RAB Community Co-Chair
Lee, Larry/RAB Community Member
Monroe, Bruce/RAB Community Member
Thorpe, Darwin/RAB Community Member
Vesely, R.Gene/RAB Community Member
Olivera, Jerry/City of Seal Beach Master Planner
Akkenapally, Sree/Insight EEC, Inc. (Insight)
Fattahipour, Mitra/Insight
Ford, Tony/Insight
Lieberman, Tara/Richard Brady and Associates (Brady)
Shields, Tim/Brady
Li,Li/Orange County Water District
Niou, Stephen/Department of Toxic Substance Control (DTSC)
Reese, Brenda/Remedial Project Manager (RPM), Naval Facilities Engineering
Command Southwest (NAVFAC SW)
Smith, Gregg/Public Affairs Officer, NAVWPNSTA Seal Beach
Tamashiro, Pei-Fen/RAB Navy Co-Chair, NAVWPNSTA Seal Beach
Werring, Paul/CDR, NAVWPNSTA Seal Beach

WELCOME

P. Tamashiro commenced the meeting at 6:00 pm at the City of Seal Beach Council Chambers by welcoming all participants. Attendees were asked to introduce themselves and to sign in and collect handouts at the front table.

P. Tamashiro introduced Gregg Smith, the Public Affairs Officer for NAVWPNSTA Seal Beach, and Paul Werring, the Executive Office for NAVWPNSTA Seal Beach. CDR P. Werring gave a brief statement on his commitment to support P. Tamashiro and the Installation Restoration Program (IRP) and Munitions Response Program (MRP).

P. Tamashiro announced that three presentations will be given tonight: A brief overview of the IRP and MRP Project Highlights by B. Reese; a brief budget status update for the IRP and MRP, also by B. Reese, and a technical presentation on the performance monitoring results for IRP Site 70.

B. Reese began with an overview of the IRP and MRP Project Highlights. She first recognized the NAVWPNSTA Seal Beach Environmental Team members involved, and then defined the Defense Environmental Restoration Program (DERP). Next, she briefly reviewed NAVWPNSTA Seal Beach IRP/MRP Site Status and gave a brief review of the clean-up process and project status for the following open IR Sites in more detail: Site 7 Station Landfill; Site 40, Concrete Pit/Gravel Area; Site 70, Research Testing, and Evaluation Area; Site 74 Skeet Range, Site 75; Former KAYO-SB Agricultural Well; and Site 229, Former UST Site. She next introduced a new site, UST Site 8, at Building 500. The site consists of a former UST that was filled with cement grout and left in place. A Site Assessment is planned for FY 12. She concluded by briefly discussed the MRP Preliminary Site Inspection and Site Inspection statuses.

Questions and answers discussed during the Project Highlights Presentation are summarized below.

Question: How deep is the tank discovered at the UST 8 Site?

Answer: The tank is approximately 8 feet below ground surface (bgs). The tank and pipeline were discovered during a parking lot pavement project, and the tank was opened with a backhoe. In 2009 the tank was filled with cement grout and left in place.

Question: Where is KAYO Site 75 located?

Answer: The former agricultural well is located along the Bolsa Chica Fence line. [P. Tamashiro pointed to the location on the Council Chambers map of NAVWPNSTA Seal Beach.]

Question: When was it determined that the diesel levels at the UST 8 Site were elevated? Why was it not identified as a site before now? Are there other contaminated sites on base?

Answer: The diesel levels were determined to be above acceptable levels in 2009 when the UST was first discovered. UST 8 was not previously identified as an IRP Site because when the site was first discovered, UST sites on base were covered separately under a NAVWPNSTA Seal Beach UST program which followed a different process. A new 2010 policy now requires that UST Remediation be covered under the IRP. As a result, UST 8 was accepted into the IPR in late 2011, and a site assessment is anticipated to begin later in FY12.

Question: Western Environmental Engineering Company found a concrete tank for bunker C. Is it possible that there are other tanks on base that have not yet been identified because the only way you can find them is by happenstance or by using ground penetrating radar?

Answer: The IRP follows the CERCLA process for identifying new sites. The majority of sites were identified in the 1980s and an extensive record search has been conducted for the base. With that being said, there is no way we can tell if we may encounter another site like this (UST 8). However, if a new site is discovered, it will be managed under the IRP.

Question: Are there any more dead geese at Site 74?

Answer: No, there have not been any additional deaths since the first incident in February 2011.

Question: Is there any additional clean-up occurring at Site 22?

Answer: The only response action taking place at Site 22 is the ongoing activities to eliminate vegetation on the island in an effort to make the location unattractive to wildlife. Contaminants are not being physically removed, however if BreitBurn, the operator, was to cease the oil production operation, a clean-up action will be planned.

B. Reese next gave a short presentation on the Budget Status of the IRP and MRP. She began with a slide showing the total environmental restoration costs at NAVWPNSTA Seal Beach, then she discussed the FY 11 projects and costs. Next she gave an overview of the budget projection for FY 12 and the FY 12 projects receiving previous and new funding, then showed graphs of anticipated funding for FY12-25. She noted that the programs may experience a cut in funding in the next year. She concluded with a list of acronyms.

There were no questions following the budget presentation.

P. Tamashiro announced a 10 minute break.

Upon return, P. Tamashiro announced that R. Wymore and M. Fattahipour would deliver the IRP Site 70 2011 In-Situ Bioremediation Performance Monitoring Results Presentation.

M. Fattahipour started the presentation by briefly reviewing the site background. She then handed off the presentation to R. Wymore to elaborate on the bioremediation process. The two then reviewed the IRP Site 70 enhanced in-situ bioremediation injections and the 2011 performance monitoring activities. Next they reviewed what was monitored and why, and then discussed in further detail the following updates to the Conceptual Site Model (CSM): lithology, groundwater flow, distribution of contaminants of concern, proliferation of Dehalococcoides culture, impacts of groundwater quality, and impacts to soil gas. They concluded the presentation with a review of the remedy performance and a list of recommendations.

Questions and answers discussed during the IRP Site 70 Presentation are summarized below.

- Question:** Did the navy hire CDM/Insight to do work?
- Answer:** Yes, CDM and Insight were hired to performed the task required for the groundwater remediation at IRP Site 70. Contract vehicles are used to hire consultants to do various types of jobs. Some contracts are sole source, others involve a bidding process. Site 70 has gone through approximately four to five different contracts. Each contractor must follow a Work Plan and Sampling and Analysis Plan that are approved by regulators.
- Question:** What are the timelines to remediate the solvents in the groundwater.
- Answer:** The timeline for remediation depends on the amendments that are added. For example, lactate, molasses and ethanol get used quickly, and if the site is anaerobic, it may only be a matter of weeks before the contamination degradation pathway is complete using these additives. However, at IRP Site 70 the EVO which was used as an additive is more complex of a molecule and it takes longer to get consumed and, it does not need to be added as frequently.
- Question:** Where do the Dehalococcoides fit in?
- Answer:** Dehalococcoides are the only bacteria know to get the bioremediation process all the way to conclusion, or the production of ethene. Bioaugmentation is the process of adding the bacteria to the aquifer.
- Question:** Does the pH exchange from brackish salt to fresh water impact the site? Is the chemistry of the water a factor in the bioremediation process?
- Answer:** Yes, this is something that is a factor at this site because sulfate needs to be consumed to get optimal dechlorination. However, sulfate does not need to be entirely consumed to enable the process to work. At IRP Site 70, sulfate levels are extremely high. Sulfate can be present in high levels and the process will still work, but if the pH goes much below 5.5 the process does not function as effectively. Adding EVO at a high concentration may actually lower the pH; in fact, after the first injection of EVO at the site, there was an initial reduction in pH. The original EVO formula contained a lactate which was later removed because it was driving the pH down too quickly in the shell horizon. The lactate was re-added to the formula for the injections in the source

area where it was better tolerated. The pH rebounded after 6 to 8 months.

Question: What is the coincidence of the length of the process (30 years), and the climate period of 30 years? What do you predict will occur with sea level rise?

Answer: The system builds up its own buffering process. For instance, the increase in biological activity generates alkalinity in the groundwater and as a result the system become more resistant to pH changes as time goes on

Question: Did you use any baking soda to buffer?

Answer: Yes, baking soda was added in the chase water. When KB1 was injected we wanted to promote a good reducing environment.

Question: Can you control pH?

Answer: Yes, we can manipulate pH if needed.

Question: What happened to the chlorine atom?

Answer: The chlorine atom became an atom in solution. The amount of chlorine added to the system from the disassociation of the solvents is insignificant compared to the background level of chlorine in the groundwater.

Question: Regensis has labs that can collect soil samples and identify bio activity that is happening in the soil and can focus on certain contaminants, such as MTBE. They found a bacterial that will eat MTBE now. Mother nature is able to deal with all sorts of manmade chemicals. The technology is exploding.

Answer: Yes, bioremediation is going on with all sorts of contaminants.

Question: Looks like you have decreased levels of contamination by 60-70 percent.

Answer: Yes, concentrations have decreased even more than that since 2008. There is an entire grid of injection wells in the source area now.

Question: What is the cost? In the old days you would have excavated the hot spots which cost \$20-25/ton plus the cost of transportation.

Answer: This plume is in the dissolved phase which makes it difficult to excavate the contamination. The pump and treat method would not have been effective, and the results would not be as drastic in 2-3 years.

Question: Is the DCE moving with plume?

Answer: Yes, in 2011 some of the concentrations of DCE have increased from 2010, and we can see that DCE is being produced from TCE.

Question: What is the composition of the barriers? Are the barriers permeable? Are they not a complete barrier? How much clay and sand are in Deep Sand vs Shell Horizon? Is the granular composition of the soil particles predictable from barrier to barrier? How do you account for the fact that some barriers are not having more of an impact?

Answer: When you look at the groundwater flow in the aquifer, you cannot see the impact. The impact is much more localized, depending on the composition of the geological formation. The term bio-barrier may be misleading. The EVO is designed to be injected like a liquid; forming a continuous blob of EVO. The emulsion breaks, and oil is released and sticks to the aquifer creating a line of aquifer oil that has the EVO stuck to it. These emulsion "barrier" do not block anything, and groundwater is allowed to flow through them. The goal is for groundwater to carry the contaminants to flow through these barriers and be treated.

Question: By the time the groundwater reaches the ocean it should be clean?

Answer: Yes

Question: You can augment the process?

Answer: Augmentation is not needed, just more amendment.

Question: The Shell Horizon, what was the issue encountered there during the injection? What is the physical chemistry of the layer?

Answer: The Shell Horizon is composed of shell fragments and shell layers, as well as fine grained sediments. This layer was originally characterized by lower permeability and conductivity, but not a difference of geochemistry. It was more difficult to inject the target volume of the EVO into the Shell Horizon; the flow was decreased to 1 gallon per minute in some of the wells. In addition, the Shell Horizon is less permeable than the other layers and the

amendment was not distributed as widely as in other areas. There is probably less sand in these areas.

The Shell horizon is a localized term used by contractor which was defined during the initial Remedial Investigation (RI) design. The Shell Horizon is thought to be a tight layer. When moving down-gradient the geological characteristics change and become sandier. The decision was made during RI design to add additional injection barrier along shell horizon.

Question: Is this process more successful than using sodium lactate?

Answer: The success of the process depends on the site. The scale of this site would not be feasible for the usage of sodium lactate, which breaks down quickly and requires additional injections more frequently. If sodium lactate was used at this site, we would have to make injections every 3 months. Using EVO we only have to make injections every three to five years. We are currently in our 4th year for some of the wells.

Question: Is the cost per pound of contaminants going to be cheaper than any other process?

Answer: We will have to see, but considering the size of the plume you're probably correct.

Comment: The terms shell and horizon don't talk about the chemistry of the shells. It is the gradient of the edge that affects the flow of groundwater. Furthermore, are you continuing to refine this process, are there other variations in treatment? At the University of Utah, Professor Mekel, in the department of Material Sciences has found a way of improving pH. He claims that human brain activity with a unified positive intention can change pH values.

Response: Thank you for your input.

Question: I find it curious that although the current concentrations are much lower than in 2008 there is a disconnect between main body and source, and they are not continuous .

Answer: The plume was continuous prior to the initial injections. [R.Wymore shows the 2008 baseline figures]. Following initial injections at the 1st bio-barrier in first sand the main body of the plume has been cut off the source.

ANNOUNCEMENTS

P. Tamashiro announced that notifications for upcoming reports will be sent in next few months. Comments are welcome.

The next RAB meeting is scheduled for April 2012. The Navy will try to work around the Spring Break schedule for area and will coordinate with the Seal Beach Council Chambers to find a suitable date.

(Due to the delay on the progress of Site 40 Groundwater Report and the Five-Year Review Report, the April 2012 meeting has been canceled. It will be rescheduled in July 2012.)

ADJOURNMENT

P. Tamashiro adjourned the meeting at approximately 7:45 p.m.