NAVY AREA-WIDE RESTORATION ADVISORY BOARD (RAB)
MEETING MINUTES
HYATT REGENCY GUAM BALLROOM
DECEMBER 10, 2003, 7:00 P.M.

Mr. Roy Tsutsui opened the meeting by introducing LCDR Tom Scheuermann, the Navy's Co-Chair, and Mr. Mike Gawel, community Co-Chair. LCDR Scheuermann thanked everyone for coming and reminded everyone that this was an opportunity to share information between the Navy and the community regarding the Navy's plans and the community's concerns. Mr. Fred Castro, Guam EPA Administrator; Mr. Michael Wolfram, USEPA representative; Ms. Laurie Sullivan, NOAA representative and others who are partnered with the Navy on environmental issues were welcomed. The agenda for the evening was reviewed and Mr. Mike Gawel reminded everyone about the posters around the room, the handouts, and the refreshments. If there are any questions, Mike encouraged the attendees to ask them. He also formally introduced Mr. Roy Tsutsui as the facilitator. In addition, Roy indicated that the RAB will be looking for a new Community Co-Chair, and this will be discussed and decided at the next RAB meeting. Anyone who is interested or who has ideas should let Roy, Mike, or LCDR Scheuermann know. There will be a formal election at the next RAB meeting. Everyone should feel comfortable to get refreshments, ask questions, and to participate this evening.

First, Roy indicated there would be a vote on venue. Periodically, the Navy likes to check with the attendees regarding the location of the meetings. The meetings used to be held at a Navy conference room, then they were held at community centers, and finally, here at the Hyatt. Over time, attendees felt the hotel environment with good parking, a good atmosphere for the presentations and such, was best. He asked if there were any suggestions or comments at this time.

Question: Will there always be two engagements, like this meeting followed by a community meeting like the one in Agat?
Answer: Tonight's meeting is the Restoration Advisory Board meeting, where we discuss a variety of projects, and the meeting tomorrow is specific to one particular project. They are scheduled back-to-back, to take advantage of travel schedules, but are really separate.

Attendees generally felt the Hyatt was fine and that the group would continue with this venue until community members express a desire to change.

Question: Is there any way to provide formal notification to elected leaders?
Answer: The Navy has addressed this previously, and the Legislative Administrative Secretary was contacted about putting the meetings on the Legislative calendar. They will continue to be notified, but the action taken on their part is at their discretion.

Ms. Darlene Ige, IR Program Manager for Hawaii and Guam, from Pacific Division, Naval Facilities Engineering Command, gave an overview update of the progress of the Navy's

Installation Restoration (IR) sites in Guam. There are 19 total sites, of which work is completed on three (3) sites, two (2) sites are pending closure, and ten (10) sites require future action. These sites will be added to the update as work proceeds on those sites. Four (4) sites, all around the Apra Harbor area, are in progress, and these sites were shown on the map. Those will be the focus of the agenda this evening.

At the Orote Landfill, the construction of the seawall and landfill cap were completed in March 2001. The Draft Phase II Investigation Work Plan for the Marine Operable Unit was completed in October 2002. The mid- and deep-water fish sampling was completed in May 2003. There will be more discussion about Orote Landfill later in this evening's meeting.

At Building 3009, a former transformer shop, the treatment of PCB-contaminated soil was completed in March 1997, and the Final Site Inspection Work Plan/Sampling and Analysis Plan will be completed in 2004.

"During" and "after" cleanup photos of the Carpentry Shop Dip Tank project were shown. The chemicals of concern were used for wood preservation, and the source was removed in February 1998. In August 2000, contaminated soil was removed. The proposed plan and decision document will be prepared next year. The Navy is recommending No Further Action at this site.

The cleanup strategies for the Lower Sasa Fuel Burning Pond will be finalized in 2004, after completing the Ecological Risk Assessment which is now in progress. The Evaporation Pond at this location was removed in 1999.

Question: Are there any provisions for adding sites to your list? What is the mechanism?
Answer: Darlene explained how a site is added to the Installation Restoration (IR) program. The IR program is based on past contamination, not present contamination. If old contamination is discovered, it is added to the IR program. If the installation identifies a site, they write a letter, and if it meets the qualifications, i.e. they have to show that it's past contamination, contamination that occurred prior to 1986. If it's within the active base, it can become part of the program. The IR program is strictly for projects within the active bases of the Air Force and the Navy. This meeting tonight is specifically for the Navy sites.

Mr. Eric Wetzstein with AMEC Earth and Environmental introduced himself as a Navy consultant and explained that he had been working with the Orote project for quite some time. His presentation focused on the background information, the seafood advisory, mid- to deep-water fish sampling, and the groundwater investigation at Orote Landfill. There are other areas of concern, but this evening's discussion will focus specifically on Orote.

As part of the background information, Mr. Wetzstein showed a map of the Orote Marine Study area and explained the difference between the boundary of the "Marine Operable Unit" or Marine OU, and the "Seafood Advisory Area" which is larger than the Marine OU. The Marine OU goes from Orote Point down to Rizal Beach. There have not been any boundary changes to

the Seafood Advisory area since the last RAB meeting. Eric reviewed the details of the Seafood Advisory boundaries–from Orote Point to Rizal Beach, and explained that it extends to the 600 foot depth offshore. This depth was chosen because it's the area where people fish. The other advisory that is still in place is the Gabgab Beach Advisory. One area between the Orote Seafood Advisory and the Gabgab Beach Seafood Advisory is also off limits due to ordnance-handling activities.

Toward the end of the Navy's Remedial Investigation of this site, they noticed that the cliff line was eroding at an accelerated pace into the ocean. The Navy decided to get this situation under control and cap the landfill. Once the seawall was completed, the Navy had resumed offshore sampling and found that PCBs and other chemicals were found in seafood in levels that may possibly not be safe to eat. The Seafood Advisory was issued by the Guam Department of Public Health at the recommendation of Guam EPA and the Navy in September 2001.

Mr. Wetzstein showed a copy of the warning signs that are posted, a visual of the Orote Peninsula and showed the various points of interest. He then continued the background information by showing photos of the Orote Beach before and after removal of debris, and construction of the seawall, as well as the appearance of the area from the seawall to Barracuda Rock.

The current study approach consists of four (4) phases, and involves the Working Group comprised of the Navy, Guam EPA, stakeholders, and USEPA. Phase I was to refine the boundaries of the Seafood Advisory area, and this was completed. Territorial reef fish were sampled, and local fishermen were involved with the sampling. Territorial fish were selected because they stay in one place and would be representative of where they are caught. A seafood consumption survey of local residents was conducted to determine what kinds of fish are consumed by residents, as well as how they are prepared, how often they are eaten and so forth.

Phase II, being actively worked on by the group now, is to identify specifically where the chemicals in the advisory area are coming from and if they present a threat to human health and sea ecology. Once there is enough information about the sources, the specific areas can be targeted. Salinity surveys have been conducted to identify fresh water seeps and springs which are potential sample areas for future investigation. Draft Work Plans to address the Marine OU were developed in October 2002, the mid- to deep-water fish sampling was completed in May 2003, and draft Work Plans were developed to address the Groundwater OU where field work is planned to start in early 2004. This is one of the more important parts of the puzzle. There are also some other areas, which Eric pointed out on the map, that investigators need to have a critical look at.

Phase III consists of refining the information on the sources if they are determined to be a threat to humans and ecology, and to perform interim or immediate cleanup if appropriate. The fourth phase is the final cleanup and monitoring if needed.

Additional details on the Phase II activities were provided to the attendees. The mid- to deep-water fish study consisted of collecting fish between 120 and 600 feet of depth, based on feedback from, and with the assistance of, local fishermen, Guam EPA, and the Department of Agriculture's Division of Aquatic and Wildlife Resources (DAWR). The objective was to get a handle on what was in that area, to collect the fish and analyze for all the chemicals of concern. The fish were analyzed primarily for PCBs, pesticides and dioxins to determine if it is safe to eat. Mr. Wetzstein showed the group a map of the sampling locations, as well as a pictorial of the types of fish which were caught during the sampling. Some participants of the sampling event were present in the audience and attendees were encouraged to ask them questions after the meeting.

The results of the sampling were that the fish furthest from the seawall had the lowest concentrations of chemicals, and were similar to the results of the near shore fish samples. This continues to point to the Orote Landfill as a likely source. Potential sources include the eroded area from the landfill which resulted in sediment and debris in the marine environment prior to construction of the seawall, a remaining near-shore chemical source or reservoir, or migration of chemicals through groundwater. All of these avenues will be explored.

The first step is to concentrate on the groundwater. The objectives of the groundwater study are to assess where the chemicals occur in groundwater under the landfill, monitor where the chemicals are going and where they are seeping into the nearby sea, and to evaluate the effect of rainfall and tidal fluctuations on chemical levels near the seawall. Mr. Wetzstein showed the groundwater study conceptual model, and explained why putting a liner in place is helpful. He also showed proposed and existing monitoring well locations, and explained the dye trace study. Monitoring wells can be used to test the ground water in various locations, and to determine water levels. Water levels are important because this helps to establish the ground water surface and determine which way it flows. The map showed springs previously identified by the salinity surveys.

During the dye trace study, two non-toxic dyes will be injected into two monitoring wells. One well is located up-gradient of the landfill and the second selected well is located at the deepest portion of the landfill. The purpose of the dye trace study is to monitor the effectiveness of the monitoring well locations and determine the direction and flow of subsurface chemicals and the groundwater. In addition to the dye trace study, groundwater samples for monitoring purposes will be collected over a period of about two (2) years, and the working group will continue to assess human health and ecological risks, ensure proper public awareness, and continue to investigate sources and their impact on nearby fish. The Navy is committed to investigating all the possible sources and pathways that may impact fish.

Question: The numbers on the graph of concentration related to health risk, what are the concentration levels?

Answer: We can get that information for you and anyone else that is interested. This graph is constructed to show concentration and actual EPA risk levels, but we can get the actual data to you.

Question: The migratory fish also had some levels of PCBs, will there be further investigation related to those fish? Based on the information provided in previous RAB meetings, some fish were migratory. Do we have any idea what caused the higher levels in the more migratory fish?
Answer: During the Phase I investigation, the results of the popular fish sampling show that many fish had lower levels all up and down the area, with no definite pattern. It is quite difficult to identify the source area, especially in migratory fish. Limiting our sampling and doing it more methodically in the 120 to 600-foot depth area, gave us the pattern more similar to the near shore territorial fish.

Marine scientist, Rolf Schottle, added a bit more detail. He indicated that the fish that were collected were fish that didn't move very far. A lot of the fish migrate more as they grow larger but not far. Some of the fish previously sampled during Phase I are considered "ranging" fish. The "ranging" fish would not be representative of the environment in the area. We designed the study and we picked the species. We looked at a lot of snappers and groupers in this data set. Some of the other fish we had may have had a higher level of chemicals in them, but this is representative of that data set as well. If you look at the entire data set, when you look at all sorts of different fish, they will uptake the chemicals at different rates. They have fat tissues, eggs, gravid, which may retain more chemicals such as PCBs, we have to look at all those factors.

Question: Is funding an issue? What about going up or downstream? The reason I ask is that people will go where the fish are. Are there risks we aren't aware of, as big an issue as Ordot? Has anything been done about other possible sites? Focusing on the migratory fish, the data presented so far is focused around the landfill and Seafood Advisory areas, and because some migratory fish showed elevated levels, is there a way to expand the study to include more areas?
Answer: The concentration around the seawall area, which shows the same pattern as the near shore fish, and the Navy is focusing on this one area until it's resolved. At a previous RAB, it was mentioned that GEPA is also concerned about other areas and wanted to look into this. There aren't any updates as of now from GEPA's Monitoring Division on the grant for which they applied.

It was noted by the community member that there was a great interest in seeing this grant approved, should the topic be discussed among any of the government officials in attendance this evening.

Question: Will there be testing on anything else? Invertebrates? Soft coral or hard coral samples? All the concerns and decisions are based on fish, but has any research been done on any of the food sources for this fish?
Answer: There has been no concerted effort to date to sample the coral. Right off the Orote

Landfill itself, coral are not terribly abundant. They are not terribly abundant in the cliff line areas. It has been a discussion point in the group as part of the ecological risk. Corals are kind of "touchy" when it comes to testing so it is generally better to use other indicators.

Question: Since there weren't a lot of coral in the area, could the contamination have prevented them from growing?
Answer: Yes, again, that is a problem to know. High waves, sediments, natural temperature conditions, and naturally the coral occur less frequently there.

We have representatives on the team that are focused on the environmental impact, and we have representatives that are focused on the human impact. On the environmental side, we have Laurie Sullivan from NOAA who is very interested in that area. Your types of comments are things that they key into.

The focus is on human health at this point and the fish as the number one item that is consumed from out there. There are others looking at the environmental side, but right now the focus is on the human side. As these investigations progress, we'll get a handle on the human health side, which is of primary importance. Ecological concerns are also of great importance and people on the team are adding to our plans for this.

In keeping with this concern, a short presentation on environmental risk assessment is being presented later on in the meeting. The USEPA representative will talk about ecological risk assessment, not just the human health side.

Question: What about migratory birds? They eat the fish in this area, perhaps.
Answer: They could possibly be brought into it through the food web. That's more of an ecological question. They are all in consideration as part of the food web and would be considered under ecological risk assessment.

Question: Assuming migratory fish have become contaminated, will the Navy assume responsibility for cleaning up in those other areas?
Answer: Essentially the study is trying to see what we can most effectively do to stop contamination, and Eric mentioned three (3) potential sources. Right now the focus seems to be related to this area according to the seafood testing that's been done on the fish, which have been sampled down to Facpi Point. Roy pointed out the various areas where contamination was found.

Question: Some contamination was found in migratory fish, so will the Navy address this?
Answer: To answer your question, we really want to focus on the sources on Navy property that the Navy knows about. That is the most prime suspect. All the evidence points there, we are looking at the prime suspects such as Spanish Steps and others. Let's round up the prime suspects. If it's outside these areas, but is a military type of thing, it would fall under a different program.

The focus of this project is the problem around here and the three potential sources. That's the target of this project and where the funding is going. Once that's resolved, upon further investigation, as the contamination goes away and the problem is resolved, then that's great. On the migratory fish, more information such as the grant Guam EPA is pursuing to see if fish in other parts of Guam are the same way, also to see if fish in other parts of the nation and the world – a lot of these tunas go quite a distance. Were they likely to have been contaminated by swimming through here? What are the likelihoods? Looking at the probabilities, the most effective way is to focus on this area and solve this and then go on further. At the same time, parallel to that, go on to see what are the fish levels in other areas and that's what Guam EPA is pursuing. We don't have an answer at this time, but we are focusing on this area because it is an area of concern.

Question: What if it turns out to be the Orote Landfill as a source, despite the corrective actions already taken by the Navy (removing the debris from the ocean and the shoreline, the seawall, the cap) what if it is still the source, what would be some of your options?
Answer: It speaks to the reason why you want to know what the source really is, if you go back to that slide, one of the things is that it could be an offshore reservoir of sediment, or an instrument, a transformer, that would be leaching. If you knew that, if you'd done enough investigation to know that, that could be picked up or maybe removed. That's something you would do. If it was from prior erosion from the landfill and it was impacting fish that had lived there for maybe ten (10) years, and you accumulate it in the body and now you stop that. You monitor that fish and maybe those concentrations will be going down over time. That's another thing you could look at to verify that's going on.

Another thing, with groundwater, is it from under Orote, from the landfill itself, or is it from farther inland? You can start to focus on that as a possibility, looking at source areas on land, seeing if that's what is happening. You have to get a hold of that question first.

What you are saying is that if we went through all these questions and answers and it turned out to still be the landfill. Is there anything you can do? We had a training session conducted during the last meeting, and it covered that there are many ways to address it if it's the landfill. For example, if the cap isn't wide enough, expand the cap. Another may be to ultimately find your hot spot in the landfill and stabilize it with a concrete cap, or remove it. Those are the kind of technical things we talked about before. However, although we don't know what selection we would do, the way to address this, if it's the landfill, the engineers have different standard ways to address those things, e.g. by expanding the cap if it's not wide enough, putting some slurry into it or whatever is needed.

Question: I'm sorry to keep going back to this.We know there's been 50 years.Why aren't we testing now? We know for a fact there are new sites they haven't identified. The concern that I have and other people have isyou have water traveling. Why are we waiting, why are we not testing migratory fish now?

Answer: Back to the migratory fish, and the data so far show the fish in the Agat Bay area that were collected show that there was no seafood advisory warranted for that, they were okay. And that included the fish that were outside the Seafood Advisory Area and included some of the mid- to deep-water fish, even the ones here on the edges according to that graph, it tapers off, in terms of migratory fish and the entire island being contaminated or something, it doesn't seem to be that way. Even the mid- to deep- water fish are going down. The only thing that was removed from the Seafood Advisory was the Agat Bay area. The group, in addressing this, (looking at graph) even though it's tapering off over here, and maybe the Seafood Advisory Area should only be the contaminated area.

Question: Where else is there a problem? When are we going to do something about it?
Comment: Here are the migratory fish, around the island – Agat Bay has no fish advisory, it doesn't seem to be all around the island. The Department of Public Health decided to maintain the Seafood Advisory as-is, although it may be misleading to folks. We are taking a safer approach at this time.

Question: What about the other sites, former military sites, that are around the island, maybe actively poisoning fish or people on land right now. Where do they exist? Is enough being done to find those? How are those investigated? To find those, how do you begin?
Answer: That's the way you approach an investigation like this. First, find the source and know where that is. Sometimes that's hard, you don't know where it is until it's discovered. It's really a monumental task to try to sample every little area around the island. So you have to find those areas and do your best to identify them. So, what program is that? There is another program for that.

Mr. Tsutsui reiterated the questions about the fish and other sites–the data for wahoo did not warrant a seafood advisory for the Agat Bay

As for other sites, Mr. Tsutsui said that is called the Formerly Used Defense Sites program, or FUDS. The Department of Defense (the military) in the past, like during World War II, had all sorts of bases, and operations, and they disposed things. But now it belongs to private entities or is Government of Guam property. It doesn't belong to the military any more, but it used to be. What's going on with those programs, because they could be polluting from, say, Nimitz Hill, or some other location. That program is delegated to the Department of the Army, the Army Corps of Engineers. The kinds of questions you have were addressed under the Government Accounting Office study, whether the U.S. FUDS were being addressed nationwide, as well as the Installation Restoration programs. They came here at the request of the Guam Congressperson in 2001, and concluded that the program on a nationwide scale was not adequate. Congress is looking at appropriating more funds for the program, including on Guam.

Walter Leon Guerrero from Guam EPA indicated that his agency would be holding meetings starting in January in Merizo (20th) and Chalan Pago and Dededo to identify former hazardous waste sites, of both military and commercial origins. Guam EPA would appreciate the public's

participation in the meetings which will be in January or February. There will be public notices as well.

Question: Can GEPA send us a notice by email?
Answer: Yes.

Question: Which of the samples is atulai (mackerel)?
Answer: They were not included in this particular study because we were looking at mid- to deep-water fish and those are shallow water fish.

Question: When will the results of the salinity studies be issued? You talked about those earlier, and that they would assist with locating points where fresh water enters the ocean.
Answer: It hasn't been reported yet, but there is a very good summary in the draft work plan for the Marine Operable Unit (OU), which is available at the library.

Question: Were monitoring wells installed yet or not?
Answer: Most have not been installed, but some were previously installed outside the actual landfill footprint during the Remedial Investigation (RI). Those within the landfill footprint had to be abandoned because of the landfill cap. A couple that were previously installed will stay, but all the others will be newly installed.

Question: How often are dye trace studies conducted, and how long do they last?
Answer: They are done once, just to check the channels and flow directions and where the groundwater is going. The analytical study is currently scheduled for about 2 years, with samples on a quarterly basis. So every three months there will be a sampling event. Once you get the initial dye trace study, you don't have to keep repeating that.

Question: Is two years going to be adequate? How are you going to know that you don't need to monitor any more?
Answer: The two years would address the shorter term problem of what's impacting the fish. Another problem is to be a sentinel for the landfill to monitor it to make sure if there is a rupture, or release, that it's caught. That would be in place for quite some time. That covers the groundwater. Fish monitoring depends.The experts are now convening to answer that question of how often we need to sample and for what duration? I can't say I know that answer right now, but there is a commitment to monitor them appropriately.

Question: You showed the statistical data earlier, what are the concentrations and what would be considered the "safe zone" on your graph?
Answer: In this particular graph we didn't put the concentration because there is so much information already. The data will be made available to Dr. Weare, and to anyone who wants it. How do you determine risk? There are a multitude of considerations as to whether or not it's safe. If you remember the seafood consumption survey we did? It's based on how much fish people eat and things like that. Right now we are using a very protective EPA standard, that's

what these lines are based on. Below the lower line would be like background concentrations, and above the second line you definitely want to look at and be concerned. If it's in between the two lines, you consider who is eating it, how much are they eating, what ways are they eating it and make a risk management decision. This data is very new and still needs to be evaluated–the Quality Assurance/Data Validation is not completed yet. That needs to be done before any risk management decisions can be made.

Question: The numbers would be helpful, this is really confusing.
Answer: As soon as the concentrations are available, the risk assessment can be conducted. This graph is preliminary, but until we have further information, the Seafood Advisory is going to stay.

Question: How about the risk assessment? When Typhoon Pongsonga came through, would that mean more contaminants going into the environment? Would there be new contamination, and how would it be addressed if the risk assessment was already conducted?
Answer: Any time new data is added, all the data is re-evaluated and human health is looked at. Certainly typhoons and large precipitation events can have an effect. If you think back to the design of the groundwater study–one of the things they want to check is to see if precipitation would account for larger concentrations.

Mr. Tsutsui addressed the concern of runoff, sediments, etc. As mentioned earlier – if you had the cap, as in this sketch I'm making now, the cap sealed the landfill, and to seal it they put several layers: water collection piping, waterproof liner, and on top of that a protective layer of coral base, and on top of that the soil. And on top of that a matting to prevent runoff, and so the grass grew, and once the grass grew, that helped protect runoff. All the materials put on top of the landfill were clean, uncontaminated materials. This clean cap is on top, preventing any of the landfill material from running off. It's all sealed inside this cap. And the seawall prevents any of the contamination, there's a liner there, too, to prevent any contamination from being carried into the ocean environment. Even though there's tons of rain, it's not going to make the landfill runoff any more.

Question: That thing is there permanently, and you have shown that, I've seen that. What you have put in there, it's going to the costs you've incurred to build the seawall and the cap you put over it.It would be so many dollars per square meter if you excavate the thing. Of all the effort to date, what are the costs for the capping vs. removal, per square meter, compared with removal? My group really wants to see removal off-island. We'd really like to see, as one of the alternatives, and followed, is total removal of the landfill and take it off island.
Answer: In previous RABs there was training in how landfills can be adequately addressed and contained and made safe with caps and certain measures that have been done here. What you are asking, with all this information, what is the cost difference between total removal and the effort required to contain it and make it safe. If it turns out there's some equalness there, maybe it's more valuable to just remove it and be done with it. So you are asking for a cost comparison. Now, what we said before, in the engineering evaluation/cost analysis (EE/CA), is that they do

those cost comparisons and removal is always looked at as one of the alternatives. That information is documented in the EE/CA.

Question: What I'm afraid is I was willing to compromise about the landfill, but in the end, I'm concerned. The Landfill at Tiyan, I accept as being capped, but this one, being so near the ocean I really want to see a cost comparison and more justification as to why we selected the protective measures instead of removal.
Answer: That's information we need to get to you, but roughly it's in the range of $70 - $90 million for removal, and the protective measures have been roughly $20 million.

Question: With the monitoring, and the manpower, the trips back and forth, and the personnel, research studies, for the next 10 - 20 years, that thing's supposed to be there indefinitely.
Answer: It's $20 million plus long term costs and liability for having it there, that cost still needs to be incorporated and compared with the $70 - 90 million. On the cap vs. removal, this may seem like a band-aid over it and removal is taking it away. That's why we had the training, to show the comprehensive thought process we go through to choose the way to go. Cost is just one of the factors. As you said, we look at risk and a lot of other things have to be incorporated into it. This project, just like all the other IR projects, goes through the RAB from its beginning stages. That was something that was addressed in the beginning stages, before choosing the landfill cap process. The different alternatives, and why we are going this way, were all things that were discussed at the time. What you are bringing up is that you would still like to see more information on that justification. We have some rough ranges here but when we get more fine tuned on that, we can share that with you.

Question: Navy IR sites on Guam, how do you decide which ones take preference and how long to get through the list we have now? What type of time frame are you looking at? The question goes back to how do we do the prioritization, and what is the time frame?
Answer: We want to address this question every time it's asked. In the beginning, and at different intervals we provided training, short 15-minute programs, and in that, we provided information on the sites, how they are prioritized based on risk for us–to human health–and then the time frame. And we provided this all. Now is a good time to review that again.

Darlene Ige indicated that the Department of Defense (DoD) uses a prioritization model, everyone uses the same one--the Navy, the Air Force, and the Army. The priorities are high, medium, and low. The DoD ranks these sites, and determines if the site is high, medium, or low risk. The goal is that high risk sites will be addressed by 2007, and that's why we work on the high risk sites first. If you look at what was discussed earlier, the future sites are mostly low to medium risk sites. The ones we are working on now are all high relative risk sites.

Question: How are you deciding?
Answer: The model itself looks at various factors. They look at receptors, maximum contaminant levels, and migration pathways.

Question: So you have data?
Answer: When we rank them, it's based on limited data points. We don't have the sites fully characterized when we rank them. We have limited data when we do rank these sites. We try to take the worst case scenario.

Question: And these will be cleaned up by when?
Answer: The goals are for completion in 2007 for the high-risk sites, 2011 for the medium risk sites, and 2014 for the low risk sites.

Question: Back to the graphs, they indicate there is contamination. This slide and earlier ones seem to indicate to me that you may have a source of contamination in the area of Barracuda Rock and some pretty high levels there and at this other location. That's never been explained very well. And if you go to the next slide where you talk about potential sources, perhaps you should add birds. Birds eat fish and birds live on Barracuda Rock.

Roy Tsutsui elaborated that the concern is that although the focus area is the landfill, we pointed out in another presentation that we're looking at other sites as well, because there was dumping besides Orote Landfill in other areas. All of the sites are being looked at as part of one study. Instead of breaking up into separate studies for Barracuda Rock, Spanish Steps, and the others, it's all one "Marine OU" area so that we could keep it in one project. So the concern is that maybe there's not enough information being presented on those other areas and sites. In particular, Barracuda Rock, and maybe another receptor on the ecological side, like the birds. Would the Navy be including more information on these sites?

Answer: Yes, that's a good observation on the graph. One thing I want to point out is that in comparison with the near shore data, there are fewer data points here. Not having data at Barracuda Rock, doesn't mean it isn't there. In the initial Phase I fish, those had a very regular interval. When you look at those near shore fish, the ones near Orote had by far the highest values. Another observation about Barracuda Rock, yes, Barracuda Rock may be linked to Orote. A couple of factors are that's the prevailing current direction, and the other factor is that there may be springs that exit in that general area. Does that answer your question?
Comment: There are no answers.
Response: Well, the answer is that they are going to first see where the connections are on the springs by doing the dye trace study. And also analyzing the groundwater to see the concentrations and to see if there is any risk from the groundwater and is that a continuing source or not. They have to answer that question. If that turns out to be a source, then stopping and addressing that is important. As far as the currents, another reason for Barracuda Rock being a contaminated area, the data we want to focus on is the near shore area because that area was done in very clear intervals with territorial fish which did not show that Barracuda Rock was a standout, it did show that the Orote Landfill was a standout. So right now the focus does not exclude Barracuda Rock since it's part of the entire Marine OU. Right now they are looking at a source of contamination as the groundwater as the next step.

Question: Is the Navy taking responsibility/liability?
Answer: If you look at the island-wide picture, when it was first addressed, and putting things into perspective in terms of what are the areas where fishermen cannot fish on Guam and what's being done for fishermen in terms of compensation, this was brought up in the RAB by members of the public and the fishermen. There are the marine preserve areas, the exclusion warning area put up by GEPA, e.g. at Tanguisson Beach, and in addition, the seafood advisory area.
The Navy can't take responsibility for the other exclusion or warning areas, but we're taking responsibility for the seafood advisory area and we have a claim form and the mayors and senators have them.

Question: On priorities, you didn't do "full" sampling. When will you have all the full evaluation to have a real priority list? For example, the tear gas, it just says tear gas, is it reaching our aquifer that we are all drinking it? We need a full evaluation. How deep is this contamination?
Response: John Fern introduced himself as a consultant for the Navy, and responded. The Navy evaluated all the potential sites in the 1983 Initial Assessment Study and created a short list of sites that requires further investigation. The tear gas site is in the Naval Magazine area, and it is away from the aquifer. During the investigation, they couldn't locate the canisters. Because of that, they recommend further investigation but it is not a "primary concern" site.

Question: Full evaluation, not just a few data points, when will we know?
Answer: When we do these reports, they include how deep the groundwater is. All these reports are all in the public library. The Initial Assessment Study Report and the Site Inspection Reports are there.

Question: When will a full evaluation be done?
Answer: The future sites are not specifically scheduled but will be completed in the 2011 for the medium risk sites and 2014 time frames for the low risk sites.

Question: That's a really long time. What if these are the causes for all sorts of diseases?
Answer: Based on the model that the military uses, it is designed to guard against that. It is designed to be health protective.

Question: Has GEPA done its own evaluation on these?
Answer: This is being done as a team, we don't do this by ourselves, we include USEPA, NOAA and GEPA as part of the team on the Orote project. In terms of other projects, GEPA is a key overseer. Walter Leon Guerrero of GEPA answered that they have not done an independent study on this, but they reviewed the Navy's work plan and reports.

Comment: Here in Guam, we have high level of disease such as cancer per capita. Angel Santos is an example of someone who passed away at age 43. We need a full evaluation to determine the scope of the threat.

Question: We understand the Navy is proposing bringing in carriers. Isn't there a proposed harbor dredging project associated with that?

Someone put the agenda back up and reminded folks that there were a few more items on the agenda. Mike Gawel suggested the next briefer make his presentation, and then there would be more time for additional questions.

David W. Charters, Ph.D. of the U.S. Environmental Protection Agency then made a presentation on Ecological Risk Assessment Guidance. He indicated that Ecological Risk Assessment is not an option, it's part of the law. ERA is the process that evaluates the likelihood that adverse ecological effects may occur or are occurring as a result of exposure to one or more stressors, in this case, chemicals. One doesn't need to show an actual effect, and this covers multiple rather than one species (human). Dr. Charters showed the USEPA framework and indicated that it was based on National Academy of Sciences work. A surrogate species is selected which is most exposed and most sensitive. Dr. Charters reviewed the eight-step ERA for Superfund projects, and indicated that the U.S. Navy's three-tier policy is consistent with this guidance. There are several Scientific Management Decision Points (SMDPs) along the way and these were shown in the presentation as being at the end of each of the following points:

- Steps 1 and 2--Preliminary site visit, problem formulation, toxicity evaluation, exposure estimate (using worst-case values), and risk calculation.
- Step 3–Problem formulation/data collection
- Step 4–Study design and design quality objectives process, resulting in a Work Plan and Sampling Analysis Plan
- Step 5–Verification of Field Sampling Plan
- Step 6–Site Investigation and Data analysis
- Step 7 – Risk Characterization
- Step 8– Risk Management

The problem formulation involves a toxicity evaluation, an evaluation of whether we are using the right benchmarks. That is the value of what we are looking at. Are they game fish, are they the most sensitive species, are they the most exposed species? Why are we looking at that? These are things like growth rates, survival, reproduction, population endpoints. That will be in the conceptual model which is tracking the contamination from the sources which are going to be soil sediment, and working it/them through the food chain so that they come up with the exposure point, or where the individual species are becoming exposed to these contaminants. We then have to develop the question, for example, do the benthic, macroinvertebrates, do the coral, show toxicity in our lab toxicity tests. If yes, is it unacceptable, if it's unacceptable, why is it unacceptable; how can we remedy the situation associated with that.

Once again we are looking at questions and hypotheses, we're not collecting data yet. We also go through scientific management decision points to make sure everybody agrees with those questions before we move forward. Only after we have agreement on the questions and are sure

that we can answer those questions do we move forward. The next step is our study design, the data quality objectives. Once again, it doesn't do us a lot of good if we want to cleanup at 10 parts per million, but our chemistry will only show us to 100 parts per million. No matter what the results of the chemistry is, you can't say it's safe and you can't say it's a problem. We want to go through this process to make sure that the data we select can be used. None of us have the money to do expensive chemical analyses that aren't directed toward the cleanup goal. We need to know why we're doing it. Lines of evidence, we don't do one test, we do multiple tests because none of them are that specific. So, we look at that, we develop different lines of evidence and then we do measurement endpoints. These are endpoints that can be measured. If we can't measure them, they become theoretical, hypothetical, and we'll never come to a conclusion because it comes to best professional judgement, and we have a lot of professionals. And we get into "Is not!" "Is so!" "Is not" and that's not productive. So we come to agreement on what we're measuring and work that out. Once again, we're at a scientific management decision point and we need to have agreement. At the end of that point, we have a work plan and a sampling and analysis plan, another document for review by the public and the stakeholders.

The next step is verification of the field sampling plan. If you've ever done sampling in the field, you say you're going to go out and get eight (8) sergeant major from in front of the pier. We don't want to get in a situation where someone goes there and finds that there aren't any sergeant majors. Unfortunately, it's very seldom that the very senior risk assessor is out there doing the fish collection. So they come back with eight of something. 2 barnacles, 1 crab, and by the time we do the analysis, that's when we discover they haven't collected the appropriate species. This way by going out and seeing that you are actually going to do what you say you are going to be able to do for running a sophisticated toxicity test, for example, coral, it's extremely difficult to run toxicity tests with because of the fertilization patterns, how they grow, different issues associated with it and there is not yet a standardized toxicity test for coral. There is a theoretical test, but we want to make sure that test works. We don't want to conclude there is no impact to the coral simply because the test didn't work. So we want to make sure all our tests work. If all the tests work, once again, our scientific management decision point is really pretty easy: "Everything worked, move on." But if there are changes, this allows us to make a concerted effort to do the right thing. As opposed to "We've got to have it done tomorrow"

Once we make that decision, we move into the site investigation and data analysis. Site investigation and data analysis is implementing the sampling plan. You say you're going to take eight (8) samples at these locations. You go out and you do that. The reality is, and the reason we have a scientific management decision point is because we're working with nature and it doesn't always work out the way you want it to. Dr. Charters gave an example related to how the weather caused unexpected high flows in a stream and that the crew had to go back and return to the site later. There can be issues in the site investigation and data analysis that run into a problem. You try to anticipate it but if there are any variances, you make sure everyone participates and what the challenges are with that, and not make any one person make the decision.

The next part is the risk characterization. Since you've already asked the question in Step Three, this is basically doing math and figuring out where the decisions are. So, we're moving down toward risk characterization.

The final step is risk management. We've made a determination as to whether or not there is unacceptable risk, and if there is unacceptable risk, what we've done is we've looked for a risk range. Above this level, we feel there will be adverse effects; below this level, we feel there are not going to be adverse effects, and there will be a gray area in the middle. The gray area is where we need to make decisions and we need to be real careful about how we make decisions in there.

The concept of this 8-step process is to move through the process so we are always moving forward. We found that if you get an iterative thing, where you could go do it three times, you never have a site where you don't do it three times. So we are saying, do it once, and move forward. And you work real hard to come up with decisions the first time, but you do it as a group, participating with all the stakeholders, all the documents are reviewed, we've done ecological risk assessments, the more people you can get involved with it, the better job you did. Because one person can't have all the analyses, literally thousands of species. What is the most appropriate species? The most exposed species, the most sensitive species. That sort of product requires a lot of people's input. So, the process that the Navy goes through brings together this extra piece, to try to make the correct decision at the right time to move toward doing what is right in the cleanup. We don't want to just look at the world as it stands. We want to focus on getting something done, moving down the path and getting sites cleaned up instead of learning more about them. The sooner we can get them cleaned up, the more productive it is and the sooner we can move on to another site and do the right thing.

Dr. Charters indicated that the guidance document is available on the internet at http://www.ert.org. He encouraged attendees to participate, and to do it as a group. This process requires a lot of input and is an iterative process that tells where you can stop.

Question: Is there something that is currently in use? Was this used to evaluate the sites on this list we saw earlier?
Answer: Yes.

Question: And that's how we came up with the high and low risk, the future sites? Have you all started the future sites yet? No?
Answer: Yes, they will use it, they are required by policy to use it.

Question: What sort of timetable are we looking at?
Answer: All funding comes from the Department of Defense, so they have to go through their funding cycle.

Question: The environmental response team that you're a part of, is that over Guam, or where is that?
Answer: We have three (3) offices—Edison in New Jersey, Cincinnati in Ohio, and Las Vegas in Nevada. We are EPA's National response team. If you see it on CNN, we're probably there.

Question: Do we have an emergency environmental response team on Guam?
Answer: Yes.

Question: Is there anyone present that's part of the environmental response team that works out of Civil Defense?
Answer: No.

Question: Once the process has started, who has the authority to make changes?
Answer: It's both EPA and Navy policy that they have to do the Ecological Risk Assessment according to the law. Unless Congress changes it, they have to do the Ecological Risk Assessment.
Additional Answer: I don't believe the Navy gets that option. If there's oversight by the EPA or Guam EPA, they don't have that atuhority. Most of the determinations of progress are made at the Assistant Secretary of the Navy level. EPA tries to be consistent. The Navy is no different than Dow Chemical. If we're going to make Dow Chemical do it, we're going to make the Navy do it. Dow Chemical doesn't get to opt out of cleaning up a site because they don't want to. I have never had a responsible party say they are dying to spend a half million dollars to do this, but the EPA or GovGuam can bring action against them for not moving it forward.

The Navy has a double whammy because of Navy policy that someone is not only violating federal regulations, but also the military policy and they can take action which would affect a person's rank and career.

Question: Now that we have a process, will you guys be informing us about timetables?
Answer: Yes. The whole process, like the Orote project for example, from the beginning before we start, we present it all to the RAB. We say here is the process we're going to use, and we're going to do this step and this step and et cetera. So for those right at this moment, we are already telling you the sites that are on the list and the priorities, and then when we start getting into those projects we'll show you which ones are next, and the timelines. We try to do this every RAB at the beginning.

There weren't any more questions.

Mr. Tsutsui reminded the group that the following night the Orote Landfill project will have a public meeting. They have a meeting whenever they have more information that warrants going out to the public. It's going to be at the Agat Community Center, at the invitation of the Agat Mayor, and it will start at 7 p.m. There will be a formal presentation with a video that gives a

comprehensive overview and go over what we discussed tonight and there will be poster stations with different topics, such as the Seafood Advisory, the data we have so far, and so on. We will have experts at each one of these. GEPA will be there along with some of our federal partners to answer questions. People will have the opportunity not only to get an overview and a formal presentation, but could also go one-on-one to the stations and get answers that way.

In addition, tomorrow, some of the Navy's federal partners will be going on a tour of the IR sites. Roy reminded everyone that the Navy always wants the public to let them know if they want to see the sites, that can be arranged. Please contact the public affairs officer if anyone wants to do that.

Question: Can some of the local fishermen attend a meeting to be present to answer questions about what they did? We'd like to hear what they thought, from their perspective.
Answer: We will see if they can do that. At previous RABs, some of them did attend. Thank you for the suggestion.

The next RAB is tentatively scheduled for June 10th, and there will be an election of a new community Co-chair then. Perhaps it could be rotated annually.

Question: Will we have an Ecological Risk Assessment update for the sites?
Answer: Yes, we will include that as part of the update on our sites.

Mr. Fred Castro, Administrator of Guam EPA, said he had been involved with and associated with the Defense Environmental Restoration Program (DERP) for about 15 years. He expressed that this process has been in the making and has surely matured now because he thinks this meeting is a benchmark event. It's a milestone that shows how this whole process--the RAB, and the linkages, and the work--involves the regulators, USEPA and Guam EPA, and the primary responsible party, the Navy in this case. We are developing a solid historical foundation here on Guam. He said he was glad these questions tonight were asked, and indicated that the group is part of what is now the leading edge of environmental restoration on Guam. He commended the Navy and the cooperative effort of the regulators in putting this together.

Question: Mr. Castro, do you think we are in danger here on Guam?
Answer: Absolutely not. From the military standpoint the past ten years, their most active mission here on Guam has been environmental restoration. Now we're seeing indicators that a carrier task group may be based here, or a redeployment at Andersen. Back when there weren't strict federal regulations, we've learned. In this new era that we're in as far as complying and corrective action, I think we are in much better shape in terms of how we design, construct, and operate new landfills, but at the same time we're doing this, we are going back and doing the cleanup and environmental restoration that came about as a result of unregulated past contaminations and mistakes. We're committed to do that. Both the Navy and Air Force spend millions of dollars each year.

There were no more comments or questions from the group, and Mike thanked everyone for participating. In closing, CDR Scheuermann thanked Mr. Mike Gawel for his years of service to the RAB (applause) and re-iterated the Navy's offer of site visits upon request. He also reiterated information about the meeting tomorrow night, and the ability to have more one-on-one discussions at that time, as well as thanking Mr. Castro for attending.

Mike also did note GEPA's planned meetings in January and February again, and asked that folks spread the word on those meetings.

Question: What about the Air Force?
Answer: Yes, they are on the superfund list and they have a RAB as well. The new Environmental Flight chief was here earlier, but had to leave. Their RAB is run differently than ours. Ours is completely informal and anyone who comes in can ask questions any time and we hope to continue that type of operation. The Air Force RAB is a typical regular RAB you see in the rest of the nation, with members being elected, and an application and approval process to ensure they have a good cross section of the affected community. The general public is welcome and there's always an agenda item which includes public comment as well as the formal presentations. Here everyone is a member of the RAB. Mr. Castro added that the Air Force RAB has been in existence for just a little longer than the Navy's. It started as the Technical Review Committee, and until the last meeting Mr. Castro was the community co-chair. There are three Navy RABs on island, including the one for BRAC at Tiyan which includes a couple of other sites, but since the BRAC process required rapid action, that one isn't active any longer. Once the cleanup is done, there's no more need for that.

Question: How will the public be kept informed if something is cleaned up again?
Answer: We'd be proposing an update schedule based on feedback from the public. The regulators aren't going to go away, either. If there are long-term requirements, say for 30 years, public notice is a part of the protocol and if a problem develops that requires more than monitoring, then a RAB might be re-activated.

Question: Who is responsible for the Toto pipeline? It was originally built and installed by the Navy and it was turned over to the Government of Guam, but who is responsible for leaks?
Answer: The GPA is responsible and they are under enforcement action. They are on the hook for cleanup, but I can't give you any firm milestones or names.

Approved by:

MICHAEL J. GAWEL
Community Co-Chairperson

FOR
KENNETH CULBREATH, LT, CEC, USN
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