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# RESTORATION ADVISORY BOARD MEETING

## Remedial Action Plan for

## Operable Unit 11, Sites 7 & 80

February 5, 1997.
Tarawa Terrace I
Elementary School,
Jacksonville, North Carolina

Reported by:

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WEDNESDAY EVENING SESSION

February 5, 1997

The Meeting of the Restoration Advisory Board of Marine Corps Base, Camp Lejeune, Jacksonville, North Carolina convened at 7:50 o'clock p.m. in the Dining Hall of Tarawa Terrace I Elementary School.

MR.MATT BARTMAN: Okay, let's get going.

[Whereupon Mr.Bartman then supplemented his presentation with the use of colored slides.]

MS.TOWNSEND: Focus?

MR.BARTMAN: Focus - I think it's your eyes, Gina. It looks fine to me.

But, my contacts are getting bad though.

Stop me at any time. Ask me any questions.

I don't know if I'll answer them, but you can ask them!

Okay, what we're going to be talking about right here is Operable Unit 11 which consists of two sites, Site 7 and Site 80.

Site 7 is known as the Tarawa Terrace Dump.

Site 80 is the Paradise Point Golf Course Maintenance Area, which is my favorite site. I wish I

could've gotten a chance to play there while we were investigating this site.

MR.SWARTZENBERG: Is that the one with the chemicals?

MR.BARTMAN: Chemicals?

MR.SWARTZENBERG: The area where they were mixing the pesticides?

MR.BARTMAN: Yes, the pesticide mixing area.

This slide is difficult to view and I apologize for that.

But, Site 7, I guess as you're sitting in this classroom you're pretty close to Site 7. It's within the Tarawa Terrace Housing Complex.

It's right off Highway 24. However, you'd be better off entering Tarawa Terrace II entrance and that would bring you to Site 7.

Site 80 is what I refer to as the main side of the Base and if you were to come through the guard gate, make your first right, go down Brewster Boulevard to the very end, you'd run into the golf course and the maintenance area within the golf course proper.

What I'd like to talk about is basically I break

these talks down into four different categories:

Where the sites are, a little bit of description of them.

Remedial investigation - what did Baker do out there.

Some of the findings.

What are the risks at the site.

And, then what are we going to do about those risks, if there are any.

Again, Site 7 is located a quarter-mile south of the Tarawa Terrace Housing Complex which we're all sitting in right now.

It's bordered to the northwest by the Tarawa Terrace Housing Community.

Bordered to the northeast by the Tarawa Terrace Community Center.

It's bordered in the southwest by the Tarawa Terrace Waste Water Treatment Plant.

And, to the southeast by Northeast Creek.

In fact, in the area of Northeast Creek, it's a complete marsh area so as you're walking onto the site and try to get to Northeast Creek, you're going to find

yourself waist deep in muck.

The use of operation of the dump are unknown. However, we do know that it was closed in 1972.

And, if you do some site reconaissance or walk around the site, you'll see discarded paint cans, discarded oil cans.

It's not unsightly, but you can see remnants of a lot of what I would call housing debris.

The site is heavily wooded and like I said, there's a marsh area in the area of Northeast Creek.

Within the site, there are two unnamed tributaries which flow in the direction of Northeast Creek and basically these receive surface water runoff from the housing community and drain away into Northeast Creek.

These sites, I apologize these don't really tell you much about the site, but I guess you can see it's heavily wooded.

That is a utility right-of-way that's cut right through the site and everything to the right is really where the site is located.

So, you can see that during our investigation we had some difficult things to do with clearing trees to be

able to get drill rigs in there and do soil borings.

We did test pits in there because of potential buried debris and different things of potential buried drums.

So, again, we had a lot of access problems to the site.

This is the community center and in the rear of the swing set you drop down I guess a fairly steep hill to the site, so even though there's access from the community center to the site, it's not something that a child would readily want to do, but it can be done.

Site 80, again it's located northwest of Brewster Boulevard within the Paradise Point Golf Course area.

I couldn't tell you which hole it's located off of, but it's a one acre site. It has maintenance buildings.

There's a wash pad there and I can't remember whether during your site tour you even viewed this area, but I'm sure Tom took you there.

The northeast portion of the site contains large soil mounds.

I'm just going to flip to the view of the site.

There's old maintenance equipment scattered throughout the site and there's this building.

This building here I believe is where they keep like all the fertilizers and the pesticides and different things and there's a building in the rear of this one where they do all the maintenance on all the golf course equipment.

This is a road that leads off of that golf course maintenance building all the way back.

And, this road comes back to the original area where we thought our problem was going to be.

Look at the soil mounds in the rear of that road.

And, the history goes back that those soil mounds were created when they dug out the irrigation ponds for the golf course, they deposited soil there.

Now, the soil wasn't the problem, but they were going to use this soil for a bar pit to build up the golf course at later times.

Well, someone said that there were solvents dumped in these soil mounds and not to use the soil

because it was contaminated.

So this is where we thought our initial problem was going to be.

But, as it turned out, this wasn't the problem at all.

The golf course was constructed in 1940, but this maintenance area started in 1946 and, as we know, it's still in operation.

So, what did we do?

Well, there were site inspections conducted by another subcontracting firm in 1991 and what they found were some pesticides in the soil at Site 7.

So, that rolled in the remedial investigation phase which we commenced in October of 1994.

And, as part of this investigation, we did surface to subsurface investigations.

We did groundwater investigations.

And, at Site 7, we did a surface water sediment investigation and an ecological investigation.

At Site 80, this wasn't necessary because there wasn't a surface water body to investigate.

It looks like it took a long time to do all this

sampling because, you know, we concluded our investigation in October of '96.

Actually, we concluded in November of '94 but because of some inconsistencies and some data gaps, we had to come back out for different sampling rounds at Site 7 to prove that our groundwater really wasn't impacted with metals.

So, really, all the investigation procedures concluded in October of '96.

But, we were not out in the field for two years, thank God.

So, what did we find?

At Site 7, we have low concentrations and infrequent detections of organic contaminants in the surface and subsurface, nothing to really write home about.

In groundwater, we have organic contaminants and frequently detected.

The inorganic contaminants are below State and Federal standards.

However, this is why we had to continue to come back out to Site 7 and do three rounds of groundwater

sampling on three wells.

The initial round of sampling, we had high levels of lead, I believe manganese, iron and aluminum which were above State standards.

So, the State recommended that we go out and re-sample these points.

Two of the points were what we called temporary wells, wells you just put into the ground, take a sample and pull out.

Well, we left the wells in place.

The other well was in that marsh area and you can literally go down to that well and grab it by the well casing and move the well like this.

So, what does that tell us?

Well, it probably tells us that they're highly turbid samples, there's a lot of sediment involved in the groundwater sample that we're collecting and that that sample probably isn't truly representative of the water.

It's probably representative more of the sediment that's in the water.

So, in those two additional rounds of sampling that we did, we used a different sampling technique where

we used low flow purge sampling to get a more representative sample of the groundwater and less of the sediment.

There's less disturbance, less turbidity in the sample.

And, from those three rounds, we show that the only inorganics that remain above State standards are iron and aluminum which aluminum really, as far as the Federal, it's a secondary MCL which means it's really for aesthetics, it's not because it creates a problem.

As far as surface water, we have metals - arsenic, lead and manganese, which are above criteria.

Again, lead and manganese, especially manganese all over this Base is above criteria in groundwater, so obviously in surface water we should also see a problem.

In sediments we have pesticides above criteria and I'm assuming that the pesticides in the sediment are due to the overlay and runoff draining into these surface water bodies depositing in the sediment and just from the overall applications across the Base from many years of use of pesticides.

From a risk assessment standpoint, we looked at

current and future residential children, current and future residential adults and future construction workers.

This is one of the few sites where we've had to really look at current residents, but with the Tarawa Terrace Housing Community, how can you not look at current residents?

Well, what we found is that there were no risks to current children.

No risk to current adults.

And, for future residents, we had a non-carcinogenic risk.

And, again, that was based from the ingestion of aluminum in groundwater.

And, for the future construction worker, there were no risks estimated.

What did we do at Site 80?

We did both soil and groundwater sampling at Site 80.

Again, we had no surface water or sediment to investigate.

There were elevated levels and frequent detections of pesticides in the surface soil.

In the groundwater, we had low levels of organics and metals.

I made a little bit of an error here.

The soil at Site 80, we might have had infrequent detections, but in one concentrated area we have a lot of pesticides.

And, what we'll lead into and I'll talk about the remedial alternative, it's in that particular area where we had elevated levels of pesticides, that problem had to be taken care of immediately.

And, what you'll see is the receptors that we looked at and discussed were future adults and child residents, future construction workers and current civilian adult Base personnel.

One thing you'll see are current civilian Base adult personnel are the people that work there.

We had to evaluate them from a risk standpoint.

You don't see the current adult and children because no one lives in this area.

And, future construction workers, that's something that's always possible.

The risks to current adult Base personnel, we

had an unacceptable carcinogenic risk there and that was mainly due to the elevated levels of pesticides in the soil which leads us to this:

For Site 7, if you remember to go back, we had no unacceptable risks.

Low levels of contamination that really didn't cause risks.

So, our proposal here is for no further action.

For Site 80, we have to use institutional controls which include the Off for Use restrictions and the only reason that is because we do have arsenic in the groundwater, both in rounds one and the second round of sampling that indicates there's a potential carcinogenic risk from the ingestion of groundwater.

MS.WOOD: What did they use the arsenic for?

MR.BARTMAN: Arsenic's often associated with pesticide use with pesticides.

It's--I wouldn't say it's used--

MS.WOOD: I always think--

MR.BARTMAN: I'm sorry.

MS.WOOD: I think of rat poison with arsenic.

MR.BARTMAN: Well, it's a poison and so in

pesticides it's also used to, say to cut the pesticides, but it's also inorganic.

I used the word "cut" but I'm trying to like figure--

MS.WOOD: I understand what you mean, yes.

MR.BARTMAN: --In the manufacturing of pesticides, you find that particular metal associated with pesticide use.

So, what we had to do for Site 80 because we demonstrated there was a current risk to the current civilian adult Base personnel was come up with what is known as a time critical removal action for pesticide contaminated soil.

And, basically, a time critical removal action is an overriding mandate to protect human health.

We need to initiate action within six months and usually these removal actions are low cost, small volumes and there's very few options for the remedial alternative you're going to take.

You kind of know that it's - I call it this. Jim may call it something else - a dig in a hole.

You go in, you take the soil, you dig it up and

you remove it, which is what we basically did in this case.

There is the need to go through many alternative decisions and screenings and evaluations to kind of know what you're going to do.

And, it's basically driven by the potential risk to a receptor like right now, the immediate need.

And, the only reason--go ahead!

MR.CALLAWAY: The removal of the soil, where was it taken?

MR.BARTMAN: I'll let Jim give you that, yeah.

The lack of action for a time critical removal action.

The only reason that this could be stopped if there's a lack of money availability, budgets, or lack of contract mechanisms to implement the time critical removal action.

So, what I'd like to do is - that's a short synopsis on what a time critical removal action is and this partnering team was able to implement this I believe within - we had the design ready to go to remove this soil in less than four months, review and then in less than

eight months, OHM was out there remediating this soil.

This may sound like a long time to you, but to me, that's very quick to have findings, a plan of action, a design and implementation in less than a year.

MR.HUMPHRIES: They were doing that when we visited the site. It's all done now, right?

MR.BARTMAN: It is done.

OHM - Jim was the Project Manager that handled the removal of the soil.

We found it. He removed it.

And, that's our jobs.

So, I'm going to let Jim handle this right now, if you don't mind, about how much was removed, how it was removed and where did it go to.

MR.DUNN: Just as a little refresher.

[Whereupon Mr.Dunn then supplemented his presentation with the use of overhead projected transparencies.]

The golf course - this is Brewster Road and the golf course is basically in there.

This is the entire golf course right in this area. This is the area that was remediated was Site A.

This is the large metal building that Matt had a picture of.

This is the maintenance area behind it.

When Baker went out and did this sampling, they had several hits over here of pesticides.

In these areas, they were sporadic, one hit out of several samples. Of course, that single sample taken was hot.

Knowing that they were going to go into time critical removal action, rather than spend time and money doing a bunch of sampling, the sampling task came over to us together with the removal.

We got these drawings from Baker.

They estimated that these were the areas that would need remediation.

The first thing we did was grid these areas and using an on-site GC determined where we had pesticides that required removal.

Each of these squares is a ten-by-ten grid.

The original areas - this is one, the big original area with the trailer getting expanded in this direction.

We knew this was all hot, so it all was remediated.

As we started our laboratory analyses, we set up this grid which then expanded in all directions until every one of these outer squares ended up being cleaned.

Remember, there were three over here?

Well, we ended up - the whites were clean, the rest was removed.

MR.BARTMAN: If you don't mind me interrupting you, Jim.

MR.DUNN: Sure.

MR.BARTMAN: But, what we did, we determined the risks and then Baker determined what the remediation levels, what level that they were going to need to remediate to.

When Jim went out and did his screening, all those points are points above what we determined our remediation levels were going to be.

Levels already protective of the individual receptors, the current civilian Base personnel.

So, everywhere that he has a black circle is above those remediation levels that we've determined.

MR.DUNN: Once we got all this sampling, we then went into remediation.

Let me take you back.

Those are all the sample points. They're not all hot. They're the sample points.

We ended up with this configuration being the areas that were excavated.

Where you have a double hash, the depth went down to two feet.

The remaining areas, the depth was to one foot.

But, that was the configuration of the final excavation.

By doing this gridding initially we saved both time and knowledge.

In the concept, we could've gone out and simply excavated the areas that Baker had delineated for us, the full areas.

By going out and doing all the gridding, we ended up with these areas which (a) were less and (b) were exactly the areas of the pesticide contamination.

When we finished with the excavation, a final sampling effort was conducted and in the final sampling

effort, we procured a sample every 50 lineal feet of sidewall and every 500 square feet of base in every excavation.

If we got an excavation that was less than 500 square feet, we had a sidewall and a base.

These samples were tested on-site with our GC and then sent off-site for confirmation by an accredited lab.

We ended up excavating 988 tons of material.

The original engineer's estimate I believe was around 700 tons.

During our process of finding a disposal site, we found a facility in Michigan that could take this pesticide contaminated material, stabilize it and put it in their Class C hazardous waste landfill at a price substantially cheaper than we had been previously quoted.

So, we ended up able to do the additional work on this delivery order and still have a savings overall for the government for this removal action.

Specifically, this material went to a facility called EvoTech in Belleville, Michigan.

MR.CALLAWAY: So, basically, they take ownership

of it after it's been delivered.

MR.DUNN: That's correct.

MR.CALLAWAY: The Base maintains ownership until delivery.

MR.DUNN: That's correct.

I've got some after-the-fact construction photos which are part of our final report.

They're a little different than the site that Matt showed earlier.

[Whereupon Mr.Dunn then distributed photographs]

This is the start which runs start to finish right through the set.

MR.BARTMAN: In going back to, you know, the initial investigation of what we thought the problem was, the upper right hand corner, we will see none of the excavation took place.

Those are where the soil mounds are.

That's where we thought our problem was.

Thank you, Jim.

And, we thought that was going to be our problem and as luck would have it, we just started to investigate other areas.

The largest excavation area which is one sample point and that particular sample point just happened to come up with the hardest hit of pesticides in the surface soil and from there, it grew into that large excavation area.

And, you can assume, you know, well, why did this happen?

Well, I mean, it's a pesticide mixing area.

There's a dirt access road that goes back to the soil mounds.

One day somebody came, had excess mixture in their tank, pulled the plug--

MR.DUNN: A little tricky thing that was in here - there's a septic tank drainfield--

MR.BARTMAN: Oh, yeah.

MR.DUNN: --Right in the middle of that.

This area, a two foot excavation, got down to the top of the drainfield, but amazingly enough, the drainfield had not been contaminated with pesticides.

So, it hadn't got into the septic field at all.

MR.BARTMAN: That's another lucky thing.

MR.DUNN: Our backhoe did, but the pesticides

didn't!

MR.BARTMAN: I mean, Nature worked to our benefit here also because we were dealing with a pesticide contaminant, not a very migratory contaminant, stayed on the surface and you can see from that excavation, mainly in the first foot.

MR.DUNN: Well, the first sixteen inches of material in this area was loam and it was all hot.

I mean, once we got down to soil, they could get to the individual areas that were and weren't.

MR.SWARTZENBERG: Did you fill it back in?

MR.DUNN: Yes.

MR.SWARTZENBERG: So, it's clean now?

MR.DUNN: Yes. We'll get the pictures to you, too.

The fill from this particular site came from the Bay, I think.

MR.SWARTZENBERG: Let me just ask a question.

You contracted somebody to move them - trucks?

MR.DUNN: Yes.

MR.SWARTZENBERG: To move the dirt, you contracted somebody?

MR.DUNN: Yes.

MR.SWARTZENBERG: Is there any special insurance policy in case the truck gets in a wreck or something?

MR.DUNN: Five million required of the trucker and ten of us.

MR.SWARTZENBERG: So, that's an insurance policy more or less of--

MR.DUNN: It's hazardous waste transporter's insurance.

MR.SWARTZENBERG: Hazardous, yeah.

MR.DUNN: They carry it and we carry it.

MR.SWARTZENBERG: Okay.

MR.DUNN: Yeah, there's about I would say 25 licensed hazardous waste haulers that serve this area.

MR.SWARTZENBERG: Oh, so, they have--the drivers have special qualifications?

MR.DUNN: Yes, the drivers have to be trained, carry cards and carry qualifications.

They're limited in the hours they can run just like long haul.

MR.CALLAWAY: Basically, they go to a class that teaches them how to handle the particular items that

they're transporting, in addition to the regular DOT certifications they have to have.

MR.DUNN: Correct.

They haven't gone to 40 hour training yet, but they do have 24 required of them.

MR.BARTMAN: Correct me if I'm wrong, Jim, but this was completed in '95 or '96?

MR.DUNN: '96.

MR.BARTMAN: '96.

MR.DUNN: We started in March and we finished in early August.

That is the entire time frame of--

MS.WOOD: Screening?

MR.DUNN: --Screening, drawings, getting into the field and doing the work.

The real field work was done in about six weeks.

MR.BARTMAN: Okay.

MR.DUNN: Early June to middle to late July.

MR.BARTMAN: For me, that's expedited.

MR.DUNN: That's pretty quick.

MR.BARTMAN: I mean, to go out there and find the problem, investigate it, fill out or write a report,

talk to the individuals involved, you know go through the design and then get it hauled out and moved out of there, you don't see it happen that quick too often.

MS.DEBOW: Pretty dramatic.

MR.CALLAWAY: Couldn't you use your pit that you've got over on two or three that you've designed to do some of this?

Would this not fall in the category of something that would work there?

MR.DUNN: There was a lot of discussion on that.

Thus far, pesticides have not been a successful bio-candidate.

I think they may be in the future as bio-technology grows.

The thing to remember, the biocells now are permitted for non-hazardous materials.

MS.DEBOW: Oh, okay, I see.

MR.DUNN: You can permit a hazardous biocell, site specific, site only currently.

That may change but it hasn't at this stage and I don't know of any move to change.

MR.CALLAWAY: So, in other words, if we found an

area that had just say a million tons and it was cost prohibitive to transport it to Michigan or wherever, we could possibly get a permit to have a biocell there on-site?

MR.DUNN: Or, look at other in-situ technologies, absolutely, yes.

MS.DEBOW: Looking at the arsenic levels on Site 80, I want to see if I'm reading this right as I was wondering whether you would be intending to re-test the groundwater for arsenic particularly at NWO.3 where it was high?

MR.DUNN: NWO.3 was.

MS.DEBOW: I think that was one that--and I may be reading it wrong.

MR.BARTMAN: No.

MR.DUNN: NWO.3 was removed as part of remedial action. That was right in the middle and wasn't it the bum well?

MR.BARTMAN: Yeah, it was a well that was put in. In 1991, they did the SI. That's when that was put in.

That well was poorly constructed and not a valid, I would say a good sampling point.

MS.DEBOW: Deteriorated?

MR.BARTMAN: Deteriorated, yeah, over time, sand packed.

Again, the turbidity, sediment, so was the arsenic truly representative of the water or the particulates that were in the water?

And, we felt from what we could see in the repetition sampling and the fact that you don't have a groundwater anywhere else, arsenic doesn't show up in the other wells, that that particular well - and from our field notes and during development of that well, some of the readings that we take, the turbidity readings - that that well was--the construction of that well was in jeopardy.

MS.DEBOW: That's valid.

Now, I didn't see in here that we have proven that we have reduced the arsenic below Federal standards and in the ecological studies I did see that there was an elevated quotient of index to rabbits and other things, so what I'm wondering is did we remove the arsenic?

Can we go ahead and assume the--

MR.BARTMAN: No, the arsenic in soil was

removed.

We didn't mention it, but the arsenic was removed - was addressed and removed as part of the time critical removal action.

MS.DEBOW: Yeah, and I do see--

MR.DUNN: In the soil.

MS.DEBOW: --Where it says we did that. I mean, that's where I couldn't see closure.

MR.DUNN: [Showing photograph]--This is where it was removed and this is the replacement that we put in.

MS.DEBOW: And, this one's fine.

This one's giving us good value.

MR.DUNN: Yes.

MS.DEBOW: And, then around this site, we're now getting valid low arsenic levels?

That's where I missed the last closing statement.

MR.DUNN: Matt, when was your last round?

MR.BARTMAN: Geez! We had arsenic initially at 102.

Our second round, we dropped to 42.

MS.DEBOW: Which is below.

MR.BARTMAN: Which is below, yeah, the State standard.

MS.DEBOW: And, that was one test.

So, what I'm wondering is are we going to do one more test or is one considered sufficient?

MR.BARTMAN: Do you want to field this one?

MS.LANDMAN: Isn't that a part of the monitoring?

MR.BARTMAN: There is no monitoring site.

MS.LANDMAN: In this particular case because we questioned the validity of the original sample.

MR.BARTMAN: Also, we have one sampling point above that criteria.

MS.LANDMAN: Right.

MR.BARTMAN: If it were known that arsenic were a widespread groundwater problem, or suspected widespread groundwater problem, you would continue to sample those points.

MS.LANDMAN: In this particular case, we didn't feel it was necessary to go back out and sample it again.

MS.DEBOW: Well, that's kind of the way I would read that.

From what you're telling me now, that even though we've dedicated some part of this write-up to tell ourselves that the arsenic levels were more than twice standard, we also are saying now that that was due to one aberrant value.

And, so now we're just going to ignore that aberrant value because we got a good value but we're not going to validate that that's true - determine which one's right, is that what I'm hearing?

MR.BARTMAN: One additional sampling is not why we're saying that it's valid.

MS.DEBOW: Okay. I like that.

MR.BARTMAN: Right.

We're saying that it's valid because arsenic in the initial round was not a problem, with the exception of one well.

So, we didn't find a site related arsenic problem.

We confirmed that, that one point was not a problem and that it was the construction of the well that was causing the problem and the sediment caused that elevated hit by doing that second round of sampling.

MS.DEBOW: Okay. Because the second question I had was concerning the environmental impact, the ecological studies--

MR.BARTMAN: Uh-huh.

MS.DEBOW: --Where it discussed the ecological quotients for rabbits as being high and I keep thinking of hawk seeking rabbits, so since arsenic will bio-accumulate I was somewhat concerned that the terrestrial receptors really could be accumulating anything left over.

That was my next question.

We didn't prove that that was not due to arsenic, but there's no comment in there that it probably was due to the pesticides that were removed.

MS.LANDMAN: Pesticide and the arsenic.

MS.DEBOW: And, the arsenic?

MS.LANDMAN: That were removed and the risk values for the ecological receptors were based on the site conditions prior to remedial action.

So with the removal of that soil--

MS.DEBOW: Should improve the risk values?

MS.LANDMAN: That should at least go away because there are no more.

MR.BARTMAN: It should. It's actually--

MS.LANDMAN: Right.

MR.BARTMAN: --Part of Gina's requirements that we demonstrate that removal of those soils, the remaining soil that's left.

So we demonstrate using those values that we have taken through our risk assessment demonstrate that those levels are not acceptable.

MS.LANDMAN: The remediation levels that were determined for removal of the soil were based on reducing the risk to both human health and ecological disasters to an acceptable level.

That's how they were calculated, so the clean-up was based on basically a back calculation of what levels do we need to reduce these risks down to acceptable levels.

We worked backwards. What does that become in the concentration.

Then we go back out to the site. All the areas that exceed that concentration were removed.

MS.DEBOW: And, particularly relative to arsenic, that 42 says we did that for arsenic?

MR.BARTMAN: No, 42 is in the groundwater.

MS.DEBOW: In the groundwater.

MR.BARTMAN: Right.

MS.LANDMAN: And, the risk to the ecological receptors were in the surface soil exposure.

MS.DEBOW: Okay.

MR.BARTMAN: So, it's where you take care of it in the soil.

MS.DEBOW: Gotcha!

MR.DUNN: The arsenic number in groundwater is probably very false.

Arsenic is a very, very heavy element and arsenic sticks to the soil and sediment and my guess is that those samples were not done with low flow.

MR.BARTMAN: The initial sample was not done low flow.

MR.DUNN: Okay.

MR.BARTMAN: That's why the second sample was done low flow in order to reduce the level of turbidity in that well we knew was poorly constructed, but we have to demonstrate, just like you're asking that question. That same question was posed by Gina and at that time, Dave's

counterpart, Patrick Walters, proved to me that it's well construction, not truly in the groundwater.

So, that's why we had to do additional sampling.

MS.LANDMAN: And, to add to the complication of that is we had to remove that well during the soil removal.

So at that point the question is do we have any reason, do we have enough concern to going back out and install a new well to replace it, take another sample or not?

We have all this evidence to show that this is no longer an issue, so what would we gain by just spending time and money to go back out there to re-install the well, to sample it one more time?

And, that's really what it boils down to.

MS.DEBOW: Now, on Site 7, I had a comment.

I was somewhat curious about the swamps down at the bottom end of Site 7.

MR.BARTMAN: I think it's a marsh.

MS.DEBOW: Marsh?

MR.BARTMAN: I get corrected.

MS.DEBOW: Salt marsh.

MR.BARTMAN: There is a difference and I get corrected.

Our ecological--I'm sorry.

MS.LANDMAN: It's both.

MR.BARTMAN: I don't know, I get corrected by ecological scientists all the time.

I say swamp. She says it's not a swamp, it's a marsh, so I don't know.

MS.DEBOW: If there are cypress trees in it, it's probably more swamp.

MR.BARTMAN: Okay.

MS.DEBOW: If there's just flats with grasses, it's probably salt marsh.

MS.LANDMAN: There's probably areas of both.

MS.DEBOW: Yeah.

We saw some decrease in macro-invertebrates in surface water down there. I couldn't quite tell what that meant.

To me, it means we that we saw a decrease in the number of clams, mussels and other macro-invertebrates that live on the bottom in the low waters of salt marshes.

Is that what I was reading? And, that wasn't

explained as possibly why, other than maybe it's due to this toxicity.

MR.BARTMAN: I get all the tough questions!

Ask a human risk question.

The fed.fix are not clams, mussels, they are micro-organisms.

MS.DEBOW: Not macro-invertebrates. The macro-invertebrates are my oysters.

The micro-invertebrates are the little guys.

MR.BARTMAN: Okay. See, I told you.

MS.DEBOW: And, this says macro-invertebrates so that's my oysters.

MS.WOOD: On Page 8 if anyone wants to follow.

MR.BARTMAN: Yeah.

I don't have an answer for you at this point.

MS.DEBOW: It seems what I'm reading here that where my concerns lie are although we are prohibiting groundwater consumption and from what you told me, we're not prohibiting residential pesticide use in this area so we're going to continue to have groundwater runoff, which may not be a RAB issue.

It may be a Camp Lejeune issue.

But, we do have some ecological impact and we haven't figured out why.

That's what I saw here that even this didn't quite identify why we're seeing ecological impact.

It could be the lead.

We've got a couple of things going on there and I was wondering if you knew anymore about that.

But, I read it as shrimp and mussels and dinner that we might be losing.

MR.BARTMAN: I don't think that's the case.

I can't give you an answer right now.

MS.LANDMAN: Can we get the ecological risk assessment person--

MR.BARTMAN: Oh, yeah.

MS.DEBOW: Thanks.

MS.LANDMAN: --Make a phone call to you and discuss the issue?

MR.BARTMAN: Yes.

MS.DEBOW: Sure, sure.

MR.BARTMAN: I apologize for that. That is not my area. I mean I should know this, but it's not something that's fresh in my mind.

MR.HUMPHRIES: Yeah, I don't think you can get--

MS.DEBOW: It may not even apply to this. It may be something where we can say, hey, look by the way, even though this isn't due to our off-site, it's something that you in the community need to be aware of and maybe use less pesticides on your lawn at Tarawa Terrace.

MR.BARTMAN: Uh-huh.

MS.DEBOW: Or, something like that.

MS.WOOD: They're not using pesticides on the lawns.

MS.DEBOW: I have no idea, but whether it's a RAB issue or just the way I was reading this leads me to believe it's a RAB issue.

MR.SWARTZENBERG: You can't get oysters to grow in water unless you've got at least--you know, I've heard of oysters growing in ten parts per thousand, but we don't have anything like that up in this area.

You have to at least get down on Courthouse Bay before you get anything like that.

The clams even less.

In fact, the hurricane killed a lot of clams because there was so much fresh water.

MS.LANDMAN: I'm pretty sure that most of the samples probably were crabs and I don't know what you call them--

MR.BARTMAN: Crayfish.

MS.LANDMAN: --They're just tiny little things.

MR.BARTMAN: I mean, this is all fresh--

MS.DEBOW: These are all indicators.

MS.LANDMAN: Right.

MR.BARTMAN: Right.

MS.LANDMAN: I agree with you. That's why we need to get you talking to the ecological person to answer any questions.

MS.DEBOW: Something's going on there, the way this is written and I'm not quite sure what it is.

Whether it's related to this off-site or something else, but something's going on there.

MS.WOOD: Well, to be anecdotal which doesn't help you at all, but we used to ride our horses down the Boy Scout area which is down, you know, from there and take off the point there and swim, we had a great time for several years.

MR.BARTMAN: Uh-huh.

MS.WOOD: And, finally, we discovered we were coming out of that water with skin rashes and an awful odor and so we gave up that in particular.

So, I don't think it's necessarily related. It's been an ongoing accumulation of variety of things in this whole area.

MR.BARTMAN: Do they say what that's caused from?

MS.WOOD: I don't know. We just decided, you know, there was a whole group of us that we did not need to be in that water on those horses any longer, you know.

MR.BARTMAN: Does the treatment plant discharge in that area?

MS.LANDMAN: If you're up in the Montford Point area, that's well up there.

MS.WOOD: No, this is you know where the--

MS.LANDMAN: Okay, you're across the creek.

MS.WOOD: I'm on the same side. It's further down toward the entrance we used to go.

The golf course is here. The Boy Scouts area is down there and we'd, you know, go off and--

MS.LANDMAN: Right, that's on the other side of

Northeast Creek.

MR.BARTMAN: Yeah, you're the other side of Site 7.

MS.WOOD: You're right.

MS.LANDMAN: That's right.

MS.WOOD: But, my point is that whole water--

MR.BARTMAN: That whole water area.

MS.WOOD: --has deteriorated in the last 25 years.

MS.LANDMAN: But, in response to your question, I suggest we get the ecological best person from Baker to discuss the issue with you and then perhaps we can get a summary of that conversation into the meeting minutes that go out to all the RAB members.

MR.BARTMAN: Right, that'll be in the file record of decision because it is a public comment--

MS.DEBOW: Thank you.

MR.BARTMAN: --That has to be addressed.

MR.HUMPHRIES: I've got a question on Site 7.

Several years ago, there was a cleaners approximately 800 yards from here that was dumping tetrachlorethylene into the groundwater.

MS.LANDMAN: ABC Cleaners.

MR.HUMPHRIES: Yeah, I didn't want to say the name.

They went to litigation with the EPA.

Whatever happened?

MS.TOWNSEND: They are working on that now.

They're in remedial action now.

It will soon be public record and they should have a repository set up.

MS.LANDMAN: It's at the Onslow County Libary?

MS.TOWNSEND: Yeah, that's what I've read that you can see all the documents associated with it, but that is definitely a superfund site and they are remediating.

And, they have gone through the same public meeting process that we have, although it's just one site so they don't have meetings as frequently as we do, but they have gone through the same process that we have for investigation and remediation, although it's taken them a lot longer.

And, a representative from the Base attended almost every one of those meetings.

MS.CASEY: I think probably Tom was probably the one.

MS.TOWNSEND: I know Tom was attending them.

MS.CASEY: Yeah.

MR.BARTMAN: The lead-in was supposed to go from the session on the time critical removal action to Rich's discussion.

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[Whereupon this part of the proceedings concluded at 8:45 o'clock p.m.]