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RAB TECHNICAL SUBCOMMITTEE MEETING

MAY 13, 1997

ORIGINAL

UNIDENTIFIED MALE: Will anybody be able to get a copy of this meeting?

UNIDENTIFIED MALE: You bet.

UNIDENTIFIED MALE: Thank you. Are you going to have it transcribed?

UNIDENTIFIED MALE: Yes.

UNIDENTIFIED MALE: All right, today we have three topics. I'm going to be talking about soil sampling at North Kelly Gardens and then there's going to be discussion about air monitoring at North Kelly Gardens, Zone 5.

Who will be doing that talking, Howard, and air monitoring?

UNIDENTIFIED MALE: Joe (Inaudible) research.

UNIDENTIFIED MALE: Joe, okay. And the other topic is going to be clean-up plans for Zone 3 ground water, and the SAIC folks are going to be doing that.

I don't know if you guys have worked out a particular order but I don't know that it matters, so whichever one of you prefer to go first.

UNIDENTIFIED MALE: Air monitoring.

UNIDENTIFIED MALE: Great, that's fine.

UNIDENTIFIED MALE: Does everyone know

everyone here? Would you like to go around the room real quick?

UNIDENTIFIED MALE: That's a good idea.

UNIDENTIFIED MALE: I'm Mike (Inaudible). I work for Mr. Bailey. I'm a Deputy Environmental Manager.

UNIDENTIFIED MALE: I'm Vince (Inaudible). (Inaudible) and Program Manager for (Inaudible).

UNIDENTIFIED MALE: I'm Chuck (Inaudible). I work for the Air Force Base Convention Units.

UNIDENTIFIED MALE: Tom (Inaudible.)

UNIDENTIFIED MALE: (Inaudible).

UNIDENTIFIED MALE: Jerry (Inaudible). Zone 5 (Inaudible).

UNIDENTIFIED MALE: (Inaudible), Program Manager for our contract with Kelly.

UNIDENTIFIED MALE: (Inaudible). Citizen.

UNIDENTIFIED MALE: Tom (Inaudible) with CH2M Hill.

MR. SAXON: I'm Howard Saxon, the Senior Project Manager with CH2M Hill and managing the air study (Inaudible).

MR. STEED: David Steed with CH2M Hill. Lead on the soil sampling of 1592.

UNIDENTIFIED MALE: John Brewer, Southwest Research, and we've been contracted to do the air survey at North Kelly Gardens.

UNIDENTIFIED FEMALE: (Inaudible), with the Environmental Protection Agency (Inaudible).

MR. JOHNSON: I'm David Johnson and I'm the representative for (Inaudible), representative for North Kelly Gardens.

UNIDENTIFIED MALE: I'm Jean (Inaudible). I'm (Inaudible).

MR. HOFFMAN: Gary Hoffman, citizen, I guess. (Inaudible).

UNIDENTIFIED MALE: I'm Mike (Inaudible.) I'm Director of Environmental Engineering at Southwest Research.

MR. RICE: George Rice. I'm a member of the RAB and I'm also the chairman of the technical committee of the RAB, which this is a meeting.

I hope that we can keep things pretty informal today and ask -- I hope, well at least while I'm up here, I hope people ask questions if they occur to them, as they occur to them.

I'll be pretty brief. Most of you know

the history of the soil sampling in the North Kelly Gardens area so I'm not going to repeat that.

Then you also probably know that there's been some question as to whether some of the samplings have been reflected in fill or in native soils.

Now the issue, I'm not going it address today, although people can bring it up if they want but I didn't plan on addressing it, was health issues and what is the significance of the led concentrations that are found in the soils and that sort of thing.

All I had intended to address today was this question of whether or not we're dealing with native soils or fills, and if you all remember my presentation at the last RAB meeting, in my opinion anyway, that has significant implications for hiding and interpreting data and, in fact, whether or not you can interpret the data in any meaningful way.

So a couple of months ago, the Air Force took many samples out in the -- Let me just point it out on this map here. They took samples both on and off base here.

The concerns that are of concern here are the ones that we're taking between the fence line and the North Kelly Garden neighborhood just north of Berman Road.

At the last technical committee meeting, the Air Force presented a nice color map where it showed that all of the samples were new soil. At that point, I raised the question that probably some of them were fill, because we assumed this was, so what we did last Friday was we went out there and we actually dug next to the points where the Air Force had taken some of its samples, and in one place we went down over a foot, and I would just like to show you what we found there and invite you all to look at this stuff at your leisure, and you can make up your own minds as to whether you think this stuff is native soil, that is the stuff that was there when no one had to move it in, or whether it's fill, essentially stuff brought in in dump trucks.

First, I'd like to show you a sample of what I call native soil. I think that this is the natural soil that occurs there. Here is a copy of like a soil at last for Bexar County. Earlier I told people that you all are welcome to make a copy of this information if you want. It will be here.

UNIDENTIFIED MALE: Do you know what the date of that soil survey is?

MR. RICE: This is old. This is from the '60s.

UNIDENTIFIED MALE: Yes.

MR. RICE: This is old. This soil here, and I'm not a soil expert but after reading the description and looking on a map, seeing what the map calls it, I think that the map is right. This is Lewisville silty clay, and when I dug it up, and those of you that saw me dig it up, it has a very nice sort of a firm texture.

When you put your shovel in it, it doesn't run like sand or it doesn't stick like clay but it kind of comes out almost like a piece of cake and then you can take your hand and you can grab it and it will crumble in your hand like that.

So here's native soil, and I think that most people would agree with me that this is the stuff that was originally there.

Now I'll just go down these little plates here in no particular order, although I got (Inaudible) here.

This is a sample from 1410, site 1410, and this is what the Air Force calls native soil, and it's not like the Lewisville, absolutely nothing like it, and I don't think it takes a soil scientist to come to the conclusion that this ain't the same stuff as what I just showed you.

Well, you know, this is from 1509, from

two to six inches, and I believe that this was also called native soil. I have a question mark here but I think that you folks also call it native soil.

Once again, I think if you look at this stuff, it's not nearly the big block that we got from 1410, but to me, it's not similar to the Lewisville that I showed at the beginning as being native soil.

Now last of all, I think there are a couple of interesting samples from a sample point 1505.

According to the Air Force, at 1505, there's a foot of fill, and then below the fill, there's native soil, so at the suggestion of Norm, I dug a sample from two to six inches, what the Air Force calls fill, then Armando and I dug out a fairly large hole, and from 12 to 16 inches, we took a sample of the material that the Air Force calls native soil at the site.

Now if you look at these two samples, I don't think, at least I can't tell the difference. I think what you got here, regardless of whether it's fill or native, these are two bags of the same stuff. I see no reason to call one fill and the other one native soil. Now perhaps a soil scientist could make a distinction between the two but I certainty can't.

So wrapping this up, it's my contention

that in conducting this soil survey, the Air Force made a fundamental mistake, the Air Force and its contractors, and that mistake was that they did not go and identify clearly native soil so that they would know what native soil looked like so that when they were then collecting samples in the area just north of Berman Road, they would have some means for judging between the two things, because I think it's clear that the samples that we have here that the Air Force is calling native soil ain't native soil, at least not if you compare it to what I think most of us could agree is native soil.

I'll be happy to answer any questions. Yes, Norm?

UNIDENTIFIED MALE: Yes, well, I'm going to present some arguments against what you stated, I guess.

MR. RICE: Sure.

UNIDENTIFIED MALE: For the sake of --

MR. RICE: By the way, I think that's a large part of the purpose of this committee is to bat these ideas around, so if you would like to come up here, feel free.

UNIDENTIFIED MALE: I can just do it from here, I guess.

A couple of things. The alleged release

of contaminated surface water into the neighborhood, when did that occur?

UNIDENTIFIED MALE: David could answer that better than I could.

UNIDENTIFIED MALE: That happened basically since I lived there. We moved there in about '65. At that point in time, Berman Road was not built up and we did not have the sewer system that's in place now. The sewer system wasn't put in till the '80s.

Berman Road, to my knowledge, has been filled up at least twice between the years of '65 to the early '80s or mid '80s, so a lot of that has been graded, removed, (Inaudible) and filled up. But even at that, with the basic topography of the general area, when you're standing in the North Kelly Gardens area, you'll see that it does actually flow downhill.

Prior to that, right there on the corner of Bank Street and I think that's Dolgreen, all of that and surrounding where the houses are built now, all of that used to flood all the way up to Berman Road and it would go down Berman Road to 36th Street, the same thing, everything that would flood, and especially when we received rains of anywhere up to three inches or better, with winds actually does drive it over.

UNIDENTIFIED MALE: Do you have any

photographs of that flooding that took place?

UNIDENTIFIED MALE: We're looking for that. I mean, it wasn't something that we kept a camera handy to take a shot of the flood, but any time we received substantial amounts of rain, it just depends on the frequency and how quick it would flood there.

UNIDENTIFIED MALE: Sure, okay.

UNIDENTIFIED MALE: What my point is, in terms of native versus non-native, and I'll just do that as the entire Kelly Gardens is built on fill. That was graded and filled. You could tell, when we ran the drainage way, the independent drainage way in two places here, (Inaudible) soil, and you just look out there, North Kelly Gardens is all elevated. It's honestly been built on some kind of fill. I mean, it sure wasn't built on so-called native soil. So when this explosion took place, I mean, this water was running over fill.

UNIDENTIFIED MALE: How far to the background --

UNIDENTIFIED MALE: Now the sample of native clay was in a drainage-way heavily vegetated and obviously very loamy topsoil and it's just not what is representative of what's in North Kelly Gardens or Berman Road.

UNIDENTIFIED MALE: So what is the point?

UNIDENTIFIED MALE: Well, if you recall my invitation to you on Friday, I said, "Let's go into the neighborhood with our shovels, go to the areas where we took our samples and let's dig there." And I think that you will agree with me when we do that, that the samples we get out of there are a whole lot more like what I'm calling native soil here than they are like what you're calling native soil, or what I'm calling fill.

UNIDENTIFIED MALE: Okay. Where does this term "Native soil" come from anyway?

UNIDENTIFIED MALE: I'll define that. What we did, we sampled a 40 acre area, and out of 40 acres, on the logs, the people logged what was the material that was sent in for analysis.

Basically over 40 acres, including this area in question, the primary description in the logs was black clay with rock, or it said something to the effect of fill, base material, asphalt, something like that.

So what the term became is people logging in the field, identified anything as fill that in their one inch diameter core that they sampled had any kind of asphalt, obvious road base, glass, things like that, were classified as fill because we knew that they

weren't, quote, native, but there wasn't any real description in the log of using the term native anywhere. It said black clay with rock.

Well, to differentiate and use things as it progressed in the risk assessment, people then turned and said, well, this black clay with rock that covers 40 acres must be the quote, unquote, termed native soil as a reference to compare it to the other stuff with asphalt, rock, glass, whatever, so the name "Native" got stuck to those samples.

What is of issue is the primary material out there is a black clay with rock over the 40 acres, so that got slid in as native. Whether it's truly a native or a farm ground or native for a quarry or for whatever, because native means different things depending on who wants to log it and what they want to use for their basis, so the term "Native" stuck with black clay with rock because that was the predominant soil type or notation in the logs of what was seen over the entire 40 acres.

UNIDENTIFIED MALE: So are you saying, Dave, that what you called native or natural, like because of the word you used, may, in fact, be fill, you're not certain, is that what you're saying?

UNIDENTIFIED MALE: Yes, fill could be

anything. Fill could be the natural materials that were moved around and replaced back down in the same spot.

UNIDENTIFIED MALE: So I think we now agree, and I no longer have, you know -- If I understand you correctly, I think what you're saying is that the samples that you were calling natural --

UNIDENTIFIED MALE: No, no, no, nobody, nobody called them natural. The term "Native" got put to them because that was the predominant soil type. Nobody used the word "Natural."

UNIDENTIFIED MALE: Okay, excuse me. I thought that's the word you used. But regardless, I think of them as almost synonymous. But what you called native may, in fact, have been brought in from elsewhere. It's not necessarily the soil that was originally there before disturbed by man, is that correct?

UNIDENTIFIED MALE: The same as what happened at North Kelly Gardens. That's not natural and native either.

UNIDENTIFIED MALE: Well, that I don't know about.

UNIDENTIFIED MALE: And the other thing is on the background sample collection, so-called native, he saw chunks of asphalt just sitting right next

to your sample.

UNIDENTIFIED MALE: Yes.

UNIDENTIFIED MALE: Yes, (Inaudible).

UNIDENTIFIED FEMALE: I think there's a couple of points that I would like to make at the end here.

UNIDENTIFIED MALE: Sure.

UNIDENTIFIED FEMALE: It's regarding the importance of whether this is fill or native soil or whatever.

It's really important to us to verify if something is native soil, if you're trying to establish clean background. Don't take, you know, samples obviously from an area that was brought in from someplace else or obviously contained native, so we usually take the samples from the area that's clean, you know, from the native soil and usually run a complete scan. We don't want to see the organics showing up.

So that issue is so high, then what we look at and what we're concerned about is what are these exposure pathways and what are the concentrations for those exposure pathways. So I think the questions that we need to be asking ourselves now is regardless of what it is, it is what it is.

Now we have to look at led

concentrations, are they an issue. And a lot of the original samples were taken at zero to six inches, which would provide the normal surface exposure pathway. That would be an interval that we would be concerned with or the inhalation or ingestion. And then we got other samples that were taken, you know, between five feet.

We've got some other ones that were taken at one and a half to two feet. That would be, I guess, the later samples that were taken. So it's really more important, it's most important at this point to kind of reconstruct what are the exposure pathways, what are we trying to represent and do we actually have a health impact from those concentrations. If we do, we need to look into source control.

But from what I'm looking at here, you've got the samples that would be taken directly across -- let's see -- (Inaudible) Drive, and those are taken at zero to six inches and those values are running 37, 22 and 28.2, you know, 25, 16. And then you took five samples later that, or the Air Force did, at intervals of one and a half to two feet, and those are running 18.6, you know, 20.4 and 18.5, which indicates to me, for that level of effort, that we don't have an issue with exposure from the surface and we're not sure it will increase with depth, which is what we would expect

from those concentrations.

Now at site S-5, where you have your higher values coming in, you've got a value of 17.65, you know, (Inaudible), which is showing at three to five feet. That's more of an indication of (Inaudible) at the site. That would not be a concern for surface exposure.

So we almost have to, at this point, to sort out what do we have, what does it mean to us and is there implications for doing source control on base.

UNIDENTIFIED MALE: Yes. And I agree with all your points but I think there's two additional points that I'm concerned about, although as a new job at TPA, may not matter to you.

One is can the sampling that was performed detect contamination events? Can they help us delineate pathways? And I think the answer to that is no, they can not.

UNIDENTIFIED MALE: We disagree with that.

UNIDENTIFIED MALE: Okay. So I guess that's my main point; can they be used to delineate a pathway?

UNIDENTIFIED FEMALE: The other thing to consider is also is if you're concerned about run-off,

metal is usually concentrated in the upper six to twelve inches.

UNIDENTIFIED MALE: Yes, I agree.

UNIDENTIFIED FEMALE: And with the kind of soil types you have here, you're not going to move, you know, vertically, so you're not going to see an increase with depth unless you have some of the things going on like, you know, solvents being disturbed, higher pH.

UNIDENTIFIED MALE: Or unless the contaminants were buried at a later date, which may well have happened here. And the scenario for that is the contaminant washes --

UNIDENTIFIED FEMALE: (Inaudible) though because how deep would they have to be buried and what would be the exposure pathway to do that?

UNIDENTIFIED MALE: Well, here's a scenario. Let me take two minutes to draw it out. Suppose we have a flood occur and that the pathway does, in fact, exist, that this material washes into the neighborhood and deposits led ground deep. Then some years later, fill gets put down over that soil horizon which led was deposited and then some years later, more fill gets put down over that soil horizon, which is the type of event we know occurred just north of Berman Road

area, because I've only been looking at that area for about a year and I've seen that happen. David has seen it often. So if you were then to go take your soil sample from the first six inches, hoping to detect that event that occurred some number of years ago but is now perhaps buried two feet down, you wouldn't detect it.

UNIDENTIFIED FEMALE: Well, I think you would have to be (Inaudible) too, in that you're also adding fill also in the neighborhood too because you would not expect, if you had run-off from the base, you would expect to see that with the zero to six inch samples because it's probably not going to go any deeper than that.

UNIDENTIFIED MALE: I think we did see that, absolutely.

UNIDENTIFIED FEMALE: Well, not at very high concentrations. I'm looking at, you know, 37, 22, 28, and the highest sample you had was 65.

UNIDENTIFIED MALE: That's right. And the statistically determined background level that the Air Force calls background is 23 or 24.

Now to me, that says concentrations of led in the neighborhood were elevated by some mechanism.

UNIDENTIFIED MALE: Unless background samples collected of the unaffected area on base is a

different scenario. Plus all the values in the neighborhood are below health effects.

UNIDENTIFIED MALE: Well, I'm not, you know, arguing about health effects. You can see Dr. Dolin. The other night she had a very good talk about the health effects of low levels of many different things.

UNIDENTIFIED FEMALE: Well, the other point to consider also is where was the highest concentration of the sample that you took? And if I recall, it was the one that was the farthest away from the base, is that right?

UNIDENTIFIED MALE: That's right.

UNIDENTIFIED FEMALE: It was near (Inaudible) Roadway.

UNIDENTIFIED MALE: That's right.

UNIDENTIFIED FEMALE: Which is what you would expect. You would expect higher concentrations, you know, near a roadway. So when you start moving back into the neighborhood, you're seeing again low concentrations in your attracted area to base background. You're looking at very, very low levels.

You've got a number of different sources for led. You're not seeing elevated concentrations. It would be very tough to try to separate what is just, you

know, led concentrations near a roadway versus trying to actually, you know, delineate a source. I think it's going to be very tough.

UNIDENTIFIED MALE: I don't disagree with that.

UNIDENTIFIED FEMALE: And what we would fall back on too is we look at a screening level for residential areas as 400, which is really significantly higher. The TNRCC has an actual level of 500.

UNIDENTIFIED MALE: I understand, I understand. And as I said in the past, there's more than health issues here. There's the issue of does the pathway exist, which I think is quite important.

Anyway, I've had my say and if there aren't any more questions -- I'm sorry, I didn't mean to interrupt you.

UNIDENTIFIED FEMALE: I think if you did have a pathway, I think you would see residual concentrations and I don't think we're seeing that, or what we're seeing is, you know, basically a background of just above.

UNIDENTIFIED MALE: Or at least a pattern of elevated levels going into the concentrated in some direction --

UNIDENTIFIED MALE: I would say the

reason we don't see that pattern is because it's been disturbed by the placement of fill. We have not sampled the proper samples. We don't know what the proper samples are any longer because of the fill.

Yes?

UNIDENTIFIED MALE: Well, when they talked about fill being brought in there, the first thing you got to know is what kind of compacting did they have on that fill. And then if there were several different fills, you can delineate that with a cut of that soil over top of it. That's going to be there. I don't care if it was 50 years ago, 200 years ago, that fill will still delineated. Different fill, if they put it in one time, that's it.

UNIDENTIFIED MALE: Yes.

UNIDENTIFIED MALE: And when you dig that hole, you don't see that. I don't really follow what we're talking about.

UNIDENTIFIED FEMALE: Well, I think we're actually talking about several different issues here. And I just what I'm wondering --

UNIDENTIFIED MALE: I'm having trouble tying them together.

UNIDENTIFIED FEMALE: Yes, I understand. Let me ask you this. If we look at a point by point, do

we still have the information here that would indicate which one of these, you know, sample points are actually from fill and which ones were from native soil?

UNIDENTIFIED MALE: Yes.

UNIDENTIFIED FEMALE: Can we go ahead and pull that right now?

UNIDENTIFIED MALE: Sure.

UNIDENTIFIED FEMALE: Because I think until we do that, we're going to be, you know, talking about this issue for a long time.

See, for example, 1504, 1505, 1404, 1405.

UNIDENTIFIED MALE: May I make a statement here just to make sure that we're all on the same page?

Right now, the CH2M Hill says that none of the samples that it collected are necessarily natural soil or native soil, whatever you want to call it. All of them may have been brought in from somewhere else. They may be fill. That's my understanding.

UNIDENTIFIED MALE: They may be --

UNIDENTIFIED MALE: Or they may be native, yes.

UNIDENTIFIED MALE: Well, even if it were natural soil, if they went in there and started up and

just like you go in and stood on red clay the whole time, go in there and turn the soil and mix the clay with the sand on top and make it a sandy loam. So if they done something like that, you know, and then compacted it, they run rollers over it, they might have got it to where it's like concrete.

UNIDENTIFIED MALE: There's documentation that there has been traffic on that area outside the base. It was used as a staging area.

UNIDENTIFIED MALE: Those are the things that have to be determined before you can -- I mean, we're talking about the wrong thing, I think.

UNIDENTIFIED MALE: Well, I don't think this is necessarily an impossible task to take all these out --

UNIDENTIFIED MALE: I know, but we're approaching it the wrong way, I think.

UNIDENTIFIED MALE: But I think in order to have data that you could interpret meaningfully here, you have to do an extremely detailed study of those soils and, like you said, look at where those breaks are, this level of fill, this level of fill, and test them as individual samples and analyze them.

UNIDENTIFIED MALE: Now for that, we did the supplemental sampling. We went into areas that had

been designated to have the constituents that labeled it fill and we went back after that for supplemental samples. They were the one to two foot. And if you look closely at that, there were 12 of them. Most of them in that area right around where the RAB members or people that were present at the first sampling said run-off would have occurred. And in those samples, we again cored and found a range of some sort of demarcation to whoever was drilling the course out there, a hydrogeologist, there was some demarcation in there, ranging from a half a foot down to a foot and a half down. That's where we collected the supplemental soil samples. They were collected, and from whatever that demarcation was down to a maximum of two feet, because that's what's used in driving risk assessments, and multiple cores may have been required to get the total volume needed. The analyses was re-run. And to my recollection, in all cases, those second samples had at or lower led values than those marked as containing some sort of fill at the surface.

UNIDENTIFIED MALE: I think that's correct in almost all. I think there may be a couple.

UNIDENTIFIED MALE: Well, another thing happened there. Whenever this supposed flood came and the led was moved around, if there was vegetation on

that soil at that time, that covering of vegetation, grass, whatever, it would have been bored (Inaudible) into the sub-soil and other things. If they would have packed the ground, chances are (Inaudible). It stayed pretty well on the surface of wherever the surface was at that time.

I know there's a lot of questions based on what you all are talking about that were not answered, not approached.

UNIDENTIFIED MALE: Well, let me say something here. First of all, there were two issues that we were going to put on the agenda today. We were just handed this one.

The issue, the two questions, getting back to your point, Sam, the first one is does the data that's been collected -- First of all, the neighbors in the area said we have a health problem. We believe that the health problem may be caused by exposures to led and a couple other contaminants. So Kelly then went out and their contractors took samples. We have a contract and then oversight by another contractor, to take a look at to see are there led concentrations or other contaminants in the area, that based upon the concentrations found, would these concentrations pose a health problem to the local residents. That question

was asked. The answer that has come back, the preliminary answer, and preliminary meaning we don't have the final report that's come back. The answer is no.

The next question that is now coming about is could there be a pathway. Even though there may not be a health problem, is there a pathway that is being shown by this data, called the data sets, is there a pathway that shows that in the case of what we're talking about here, led, that came from Kelly Air Force Base and actually went out into the community?

The information that we collected, not we Kelly, but by the contractors, indicates that there is no pattern to this such that there's no belief that the led came from here and was disbursed out there.

A supplemental question came in from various people saying you've got jet fuel storage tanks over there. You had led stored in those tanks. We've gone back to talk to the vendors that have provided the fuel and the vendors for the current JP8's, the vendors for the JP4 -- the JP4 was stored in these tanks prior to what is stored there now -- and provided data that said we did not use led in the fuel, nor was it used as an additive to the fuel coming into Kelly Air Force Base, so what we've done is to provide this information

to the public.

What we are now, what has occurred, there's a letter that Mr. Breohouse (?) wrote to Mr. Rice, dated a couple weeks ago, and I believe you got a copy, and it basically says we've been through the sampling, we've collected our data, we submitted it for scientific review to the regulator, Ms. Scuny and her counterparts at EPA, and Gary Byers and his counterparts at the state. If there's something inconsistent with this that we need to know about it, please let us know, but until the final report comes out, we're not going to go back out there and collect more samples because of what the information shows.

So those are the specific questions as we see them and those are the answers that we provided today.

UNIDENTIFIED MALE: Okay. Camille, did you want to go through those things on a point by point basis?

UNIDENTIFIED FEMALE: Well, it would be best, I guess, that we wait till the final report is out and then go over all the information.

UNIDENTIFIED MALE: Okay. In that case, I'll just wrap up now and just say that regarding my main points today, that what was collected out there is

probably not native soil or natural soil. That's probably fill. I think that CH2M Hill and I are in agreement, that these samples do not represent natural or native soil. They represent something that was brought in from elsewhere.

UNIDENTIFIED MALE: No, I have to contest that.

UNIDENTIFIED MALE: No, that's not correct.

UNIDENTIFIED MALE: Okay, then please correct me. Please correct me. What do they represent?

UNIDENTIFIED MALE: They represent the soils most commonly out there. Or no, they actually represent the soils that are out there now, over the 40 acre area. I mean, they represent what is there. It's a black clay with rock, it's most common. There are areas with materials in there that include asphalt, base course, et cetera.

The materials, in some places, have been driven over. A lot of people out there park their cars, and a true determination of whether they are a natural occurring soil or a native soil can't be determined. They may or may not be. They may have been reworked. It's obvious that through building the subdivision and

the work out there, that everything out there at some point has been disturbed.

UNIDENTIFIED MALE: Okay, I still think we're in agreement. The soil samples that were collected may or may not be a native soil. It's difficult to tell. I contend they're virtually all fill, but we're certainly much closer now than I thought we would be when the meeting started.

UNIDENTIFIED MALE: It's also representative of what would have been there when this flooding took place.

UNIDENTIFIED MALE: You don't know that.

UNIDENTIFIED MALE: What is to say it wasn't?

UNIDENTIFIED MALE: Wait, wait, wait. We're not going to get into a debate here.

UNIDENTIFIED MALE: Yes. Okay, so that's, I guess, the end of the first part, and Joe Brewer from Southwest is going to tell us about air monitoring plans in the same area, North Kelly Garden area. Joe.

MR. BREWER: I made some copies of the view graphs -- unfortunately didn't make enough, so I'm just going to put them on the table here. I can get some more if somebody really wants them.

Well, I'd like to start out by saying this presentation was prepared originally for the public meeting, so please, if there are any questions, go ahead and interrupt. I don't know if it's going to carry the detail that you need here.

This slide gives us an idea of the program status currently and the yellow line represents where we are currently. We've looked at the chemistry of the JP-8 fuel stored at 1592 and we have also looked at analytical and collect methodology for conducting ambient air surveys in the 1592 area as well as North Kelly Gardens.

The remaining tasks are to look at the actual release point, 1592, measure JP-8 constituents in the North Kelly Gardens area and then evaluate the community risks associated with those JP-8 constituents.

UNIDENTIFIED MALE: Joe, 1592, are those the tanks?

MR. BREWER: Yes. When I refer to 1592, I'm talking about the whole storage complex, including distribution points, valving, piping, tanks, the whole nine yards.

UNIDENTIFIED MALE: Okay.

MR. BREWER: The goals of the overall program is to measure the fugitive emissions from 1592

and specifically look at sub systems within the site, the storage tanks, the leaks from the floating pans into the atmosphere, distribution systems, valving, pumping, specific operations within the system and north 1592 area as a whole.

We use that data to locate and determine sampling procedures for the neighborhood, North Kelly Gardens, and we'll collect samples there and then we'll use those numbers to evaluate the community health risks.

When we looked at JP-8, I'm sure all of you know that JP-8 is a multi component compound similar to JP-4 and kerosene, with one major difference. The compounds in JP-8 are skewed more to the heavier constituents and as a result, your head space concentration or the airborne component of JP-8 is a much lower concentration that you had see in JP-4 or kerosene.

The one point that I want to mention is that the vapor compounds or components in the head space that are an associated with risks are present in JP-8, they are at lower concentrations. And one specific compound is benzene, which we're concerned with right now.

A lot of people don't find benzene in

bulk analysis of JP-8, but in the head space analysis, there are trace levels of benzene.

We selected NIOSH Method 1550, which employs a charcoal collection and carbon disulfide desorption of the samples in order to look at the hydrocarbons in ambient air.

A technique was needed to differentiate those components associated with JP-8 from the ambient background concentration so we selected four indicator compounds, Methylcyclohexane, Nonane, Decane and Octane, to be indicative of the JP-8 component in the ambient hydrocarbon background, and we're going to use those four indicator compounds in the samples ratioed back to the original JP-8 head space concentration to get an idea of what contribution JP-8 has to the overall ambient hydrocarbon data.

UNIDENTIFIED MALE: Joe, I guess those are the most volatile or maybe the most common?

MR. BREWER: No, actually they're the most indicative of JP-8 and some of them aren't very volatile. For example, Decane and Nonane are fairly substantial compounds, which in JP-4 are at much lower concentrations than something like benzene but they're a major components in JP-8 head space.

UNIDENTIFIED MALE: Basically air

sampling?

MR. BREWER: Yes.

UNIDENTIFIED MALE: What kind of control was used? When you're talking about this JP-8, what kind of a natural control did you use to compare it with led?

MR. BREWER: What, sir?

UNIDENTIFIED MALE: To differentiate from the ambient?

UNIDENTIFIED MALE: Yes. What do you use that to compare that to?

UNIDENTIFIED MALE: To differentiate it from the ambient hydrocarbon background, these four indicator compounds aren't prevalent to a great extent in background hydrocarbon concentrations.

UNIDENTIFIED MALE: You're talking about air, clean air?

UNIDENTIFIED MALE: Yes, sir.

UNIDENTIFIED MALE: They're not common in gasoline, for example?

MR. BREWER: Well, they are in gasoline but not to the extent they are in JP-8. And using this mechanism, hopefully because there's a unique ratio that those compounds have in JP-8 head space, we'll be able to differentiate --

UNIDENTIFIED MALE: Now when you say head space, what are you talking about?

MR. BREWER: The space above a liquid pool of JP-8, so you have say a storage tank and you change the level --

UNIDENTIFIED MALE: That's the head space?

MR. BREWER: Right. And there's going to be a concentration of these compounds in that head space.

UNIDENTIFIED MALE: In other words, you're not talking about like air in this room, you're talking about --

MR. BREWER: You have an ambient hydrocarbon background in this room.

UNIDENTIFIED MALE: Okay. And what kind of a situation do you have that's native that this information can be compared to?

MR. BREWER: We're going to collect background information at the time of sampling. We're not going to use historical data.

UNIDENTIFIED MALE: Well, we'd like to get that in an open (Inaudible).

MR. BREWER: We're going to collect background data in North Kelly Gardens at the time of

the survey.

UNIDENTIFIED MALE: I mean, are you going to get far enough way to where none of this will be effected?

MR. BREWER: No, sir. The object of the game is to determine what component of that background hydrocarbon is associated with 1592. In order to do that, you have to get in the same area, not in the plume but in the same area.

UNIDENTIFIED MALE: Upwind.

MR. BREWER: I've got a map. We'll get to that and maybe that will help us out a little bit.

UNIDENTIFIED FEMALE: The four indicator compounds again were?

MR. BREWER: Methylcyclohexane, which is the most volatile of the four, Decane, Octane and Nonane.

UNIDENTIFIED MALE: Joe, why aren't you choosing the most volatile or the most likely to escape components? It seems to me if you were trying to detect an emission, you would want the things that are most readily omitted.

MR. BREWER: Well, there's a fine line. Methylcyclohexane is fairly volatile. The problem with the very live end hydrocarbons is they're everywhere and

it makes it more difficult to say yes, this amount of JP-8 is present and so you pick something that is unique to JP-8.

UNIDENTIFIED MALE: Since you're going this route, is it possible that there will be emissions at some level that you just won't detect because of the indicator compounds?

MR. BREWER: There's a detection level, yes.

UNIDENTIFIED MALE: I think we don't want to confuse the fact that we're sampling everything that we can see. However, because JP-8, there's no such thing as JP-8. I mean, it's a collection of things that is distillery range. The refinery makes it. It starts at one temperature --

(Tape cut off. End of Side 1.)

(Beginning of Side 2.)

UNIDENTIFIED MALE: (Continuing) -- the carbons above it, it would be almost impossible to tell the difference unless you looked at very carefully the distribution of those different types of compounds that make it up, because gasoline is more volatile. It has compounds that evaporate easy so they're much more lighter compounds, if you will.

So the JP-8 has a little bit heavier

compounds in it so, you know, they're more distributed that way, so to try to calculate back to what JP-8 will evaporate, you've got to use some indicator compounds, and so we'll use these four indicator compounds, which have no health relevance at all. I mean, they're just indicators of JP-8 itself, and then we can back calculate to the amount of JP-8 that actually leaves the tank or the pump or during the transfer.

Now during the sampling, we'll be looking for those compounds in addition to those that have health relevance. You know, things like the toluenes and the benzines and so forth like that, which really are required to do the health risk.

But as Joe points out, because this is an urban environment, people use gasoline, people use other solvents and there's other industrial operations, many of these compounds are ubiquitous in our atmosphere, so to avoid, you know, associating those if they're in the background with the actual operation of this fuel storage transfer operation, we'll collect samples upwind that we'll say okay, this is what the wind has in it, the clean air, and I hate to use the word clean air in San Antonio in this industrial environment but the air that is not associated with the JP-8, we'll use that as a background and say okay, as it goes by the storage

facility now, it will pick up some level of these hydrocarbons that are from JP-8 and we'll try to tell the difference that is, you know, the increase in concentration that's seen as, you know, things are volatilized out of the operation.

UNIDENTIFIED MALE: What will the control mechanism be?

MR. BREWER: Let me get to some plots here. Let me get to some maps here, and basically I'll go through 90 percent of this. But anyway, so we have a mechanism to calculate JP-8 related emission.

Additionally, as Mike said, we have to look at certain individual compounds such as benzene and toluene that are associated with risks on their own as individual components, and that will be collected also using this charcoal procedure.

To do the fugitive or system 1592 releases and to characterize that, we're going to use point monitoring and area monitoring to look specifically at all distribution points, all individual operations within the facility and the tank leak points. That's going to be the first step. And in doing that, that's going to give us a release amount from system 1592, and we're going to take that amount, model it into the neighborhood to establish our

locations in the neighborhood.

Now we have to be careful in doing this because most fugitive studies are done over the course of years so you incorporate environmental conditional changes, you incorporate operational changes.

The other way to do this is to develop a worse case situation at the site so you do a conservative estimate of release, and the release technique we have chosen, so we have established worse case operating conditions for 1592, which will allow us to use the single event and say this is representative of any possible scenario that can occur at 1592, and that worse case event must be reasonable as far as the operation.

You can't do like they did up in Austin and say, well, right now we're going to assume every valve in the place is leaking and all the trucks have turned over and that's going to be our maximum possible release. Well, that's not being realistic.

We have selected an increased rate and frequency of truck filling and emptying of about eight fold as our worse case and we have also gone in and evaluated the optimum environmental conditions to give us the highest concentration down wind in the neighborhood, and those environmental conditions are

very low wind speed and elevated ambient temperature that have the biggest impact on down wind concentration.

So when we do any of this sampling, we're going to be looking at this worse case operating condition and have environmental conditions that are conducive to elevated concentrations.

UNIDENTIFIED MALE: I don't think I'm following you, Joe. Are you actually going to conduct these worse case conditions out there when you collect your samples?

MR. BREWER: Well, with as much influence as I have over the ambient temperature and wind speed, yes. We're going to line up trucks.

UNIDENTIFIED MALE: So there will be physical things out there, this is not just a mathematical study?

MR. BREWER: No.

UNIDENTIFIED MALE: You'll pump gas and do all that stuff?

MR. BREWER: They're going to line up trucks to have a continuous through-put of trucks at basically double. The rate is going to be doubled. We're going to fill them and cycle two trucks instead of one and we're going to do it continuously over the event.

UNIDENTIFIED MALE: Now when you say ambient temperature, are you talking about soil temperature, air temperature?

MR. BREWER: Air, ambient temperature.

UNIDENTIFIED MALE: Do you consider the soil temperature in your study?

MR. BREWER: I have a summary slide. This study is to look at current JP-8 handling and storage operations as to that impact on the neighborhood, we're not going to look at deposition, we're not going to look at stuff coming up from the soil. We're going to look at JP-8 associated risks and that's it.

UNIDENTIFIED MALE: (Inaudible) that soil temperature on your air temperature?

MR. BREWER: It will be covered in the ambient temperature, yes, sir. We only need to take measurements of the storage temperature in the tanks and then the ambient temperature in the environment, because what ambient temperature increases drive is the amount or concentrations of these hydrocarbons that are in the head space above the fuel. The higher the temperature, the higher the concentration in that vapor. So soil temperature really doesn't enter into it, other than it heats up the tanks to some extent.

UNIDENTIFIED MALE: And with the worse case scenario, we'll be able to measure the maximum possible emissions, look at the worse possible air effects on North Kelly and allow the maximum health risks to be predicted.

UNIDENTIFIED MALE: I'll get to the maps.

MR. BREWER: Once we have this release rate at 1592, we're going to model that concentration into the neighborhood to assure that the techniques we use in the neighborhood will give us adequate sensitivity and allow us to select the proper location to measure the plume from 1592.

Just for an example, we did an estimate using a two truck fill system, where we calculated the release rate from filling two trucks at a time over one hour and these are the resulting airborne concentrations that we modeled to 600 meters out from system 1592. And you can see here the normal production rate, which is currently what goes on at the site, and our worse case scenario that we're going to sample under, and you can see the difference in concentration. It's about eight fold.

And just for information, the property line is at 130 meters, the neighborhood starts at about

150 meters from the site. The number that we'll use in this instance is the TNRCC screening limit over one hour of a thousand micrograms per cubic meter, and we'll get into those numbers in a second.

The Effected Screening Limit or the ESL which we're going to use to see if we're in criteria or not or to see if we have a problem is based on many other things besides health risks. Specifically odor, ventilation effects and corrosion.

For example, hydrogen sulfide, you can perceive that compound at a level much below anything that would cause a health risk. Well, that's kind of like the ESL's. They're based on things other than health effects.

The important thing is that we must be able to measure the compounds at the ESL, and therefore our background concentrations must be statistically valid to a point where we can differentiate the ESL in our sample from the general background in the area. And at these very low concentrations, that's extremely difficult to do so we're going to put an emphasis on background concentration monitoring.

UNIDENTIFIED MALE: Your ESL's, are they the same as your detection limits?

MR. BREWER: No, no, some of them are for

some compounds, but that's our point in saying we're going to model this stuff to assure that our method will give us the sensitivity that we need.

UNIDENTIFIED MALE: So you'll attempt to be as sensitive as you can in detecting these things?

MR. BREWER: Right.

UNIDENTIFIED MALE: One point needs to be made on that ground. Those concentrations were as JP-8's, and it's a funny number because even though, as JP-8's, you may be measuring only a few parts per million of the material, but when you back calculate that to JP-8, it becomes small. That's just the way the method is set up, because you actually calibrate with pure JP-8, you know, itself, but then you start looking at volatile components in there and they're much different, so you've got to -- it's a funny way of looking at what an ESL is based on, because it's based on total JP-8.

MR. BREWER: Now there are ESL's for specific compounds as well, and to kind of get at what you were referring to, at 260 micrograms per cubic meter, the individual compounds, be that toluene, benzene, xylene, whatever, are down two orders of magnitude below that. So our method has to get down that low to see it, so yes, we are on the bottom end.

UNIDENTIFIED MALE: But we're going to be able to adjust that through extended run times and flow rates to make sure we have adequate sensitivity.

MR. BREWER: But once we model the thing out, this is a plot of what a south south-westerly wind would plot out to as far as sampling locations, and bear in mind we're not establishing a grid across the entire neighborhood. The sampling approach is going to be to set up a perimeter, if you will, to define the plume of airborne release. So what we want to be able to do is see an increase along this center line, which is down wind, compared to background samples collected in this area.

So to define the plume, we're going to take four center line distances, as you can see there, and two distances at 300 meters, and on the property line, we're going to extend laterally to ten percent of the center line concentration and a half percent of the center line concentration, and that's a standard practice to define plumes that way.

UNIDENTIFIED MALE: I'd like to point out that those little dots there are where the sampling will be.

UNIDENTIFIED MALE: But that's my question. How mobile are these samples? I mean, if the

wind shifts, do you move your sampling location?

MR. BREWER: No, you establish your conditions in the morning. If you have environmental changes and wind shifts and all that, the duration of this event is not going to allow us to shift and you'll have to make a decision whether you want to repeat it or use that data.

UNIDENTIFIED MALE: Will you have a little weather station set up?

MR. BREWER: Yes, we will. This will be plotted the morning of the test so we'll actually site the locations an hour before the test.

UNIDENTIFIED MALE: When you're doing your background, there is no monitor south of the actual physical complex that would --

MR. BREWER: Yes, I was going to get to that. You see here we have eight additional background samples. That will probably be more like fifteen, of which three are located upwind of 1592, one at 50 meters, and to separate, there's a parking area below this, and I want to separate that so we'll go upwind of that parking area as well.

There's going to be three or four samples in this area to get background contributions from Berman Road. General McMullin, which runs down here, will have

two set up probably in the neighborhood over here, in order to establish the background and hopefully get some kind of increase in concentration along this line so we can define a plume. But as you can see from the previous slides, the level is extremely low.

UNIDENTIFIED MALE: Also will humidity be taken into consideration with this? Because that also determines the volatility of specific compounds and whether they stay in heavier concentrations or lighter concentrations in conjunction with the ambient temperature.

MR. BREWER: It's my understanding, and somebody correct me if I'm wrong, that the temperature of the fuel in storage is the primary motivator, if you will, of head space concentration.

Now when you push that out into the ambient air, high moisture contents and things like that will allow migration on the droplets of moisture, but then you get deposition.

UNIDENTIFIED MALE: Primarily these are very what you would call hydrophobic compounds. They don't like water. If you add something like an alcohol, you would be absolutely right, in the fact that they are, you know, water soluble and they would have an effect on the evaporation, but these are very

hydrophobic, you know, gasoline type compounds that shouldn't be effected.

MR. BREWER: So to answer your question, the moisture content at the source, not that it really doesn't play a part, once you get out into the environment, the method that we're using will collect anything that is there, so as long as it doesn't effect the actual transport mechanism, which my understanding it won't, we shouldn't have a problem with that.

We looked at ceiling height, wind speed, wind direction, wind speed, ambient temperature. There were a couple of other conditions that we looked at. Mixing height.

UNIDENTIFIED MALE: The only reason I bring that up is because the information that we received from Dr. (Inaudible) and the other internal medicine doctors is that the worse case scenario for ingestion is actually through a high cubic content and I don't think you're going to get any opposition to what the volatility in the plume rows of the JP-8.

But I guess the other question is, using this particular model, going back to associated pathways and what not to include this, because we're the ones who gave the original wind rows, would these calculations also be made to do comparisons versus JP-4, JP-7,

considering the chemical weight, volatility, the whole nine yards?

MR. BREWER: They can be, but the importance --

UNIDENTIFIED MALE: Are there calculations that can be done so that calculations would show -- (Inaudible).

MR. BREWER: Well, that's a fairly tall order to do.

UNIDENTIFIED MALE: I mean, the point is we don't even know what's going to happen in the defined plume.

MR. BREWER: Yes --

UNIDENTIFIED MALE: I guess what you're doing is defining the tests to see whether or not it's actually something that would really, really be --

UNIDENTIFIED MALE: We're coming to grips to see if we're even going to measure anything out there because these measures are low. The only release point of significance is the filling of transfer trucks. The tanks are scrubbed, they have floating pans, so you've got very few leak points in that system.

Now we're going to look at JP-8 and you can extrapolate things based on historical data to JP-7, JP-4, whatever you'd like to do. The difference being

that we're not going to use any historical data in this study. It's all going to be measured data.

MR. BREWER: And when we go to evaluate risks, there's two primary standard areas that we're going to use, the ESL from TNRCC and those compounds which have reference doses through EPA. So the individual components, if there's a (Inaudible) referenced to us or one of the other ones, the east table, those can be used to calculate the risks. And the TNRCC ESL's are nothing more than a ratio of concentration which we look at.

UNIDENTIFIED MALE: Cumulative effects can be obtained simply through summing the individual components.

UNIDENTIFIED MALE: Joe, could you just give an overview of exhaustive research that Southwest did in developing protocols and methodology?

MR. BREWER: For the analytical?

UNIDENTIFIED MALE: For this effort.

MR. BREWER: The one thing -- Well, I'm not sure in doing the risk calculations, we haven't really used --

UNIDENTIFIED MALE: I'm just talking about the sampling protocols and all that.

MR. BREWER: The sampling method

selection was based on MDL studies, detection limits studies and some rigorous spiking routines that we did back in the laboratory to assure ourselves that we had the sensitivity to see something like benzene at three parts per billion in the ambient air under these conditions, and that was part of that second tasking block in the entry slide.

Charcoal, the NIOSH 1550 method is accepted throughout the industry as an ambient air sampling method for the NIOSH and workplace people. We didn't know if it could be applied to this condition under elevated collection flow rates and extended run times so we had to do a series of spikes to make sure that we had retention of the compounds on the charcoal and then the extraction procedure gave us adequate recovery.

UNIDENTIFIED MALE: Do you think this method you're going to use is the most sensitive that's practical to use out here?

MR. BREWER: Well, I think it's the only method we can use because charcoal is comprehensive to all of the components, all of the hydrocarbon components there are there.

If you get into things like Tenex or Chromasorb or other types of collection media, you

really skew yourself to either the very light end compounds or the heavier compounds. Most importantly, charcoal doesn't present an inherent hydrocarbon background that you get with a lot of the other resins. Resins that are polymer in origin, plastic beads or whatever, contribute, when you go to extract them, they release hydrocarbon components so you get cross contamination. You don't have that problem with charcoal.

UNIDENTIFIED MALE: So there are more sensitive techniques but you don't think they're appropriate?

MR. BREWER: No. The technique, the sensitivity is going to be obtained in the instrumentation, not necessarily the collection method. We have established that the collection method will retain and recover everything we put to it at the sampling conditions.

The next step is to select the analytical instrumentation that gives you the greatest sensitivity.

UNIDENTIFIED MALE: I see.

MR. BREWER: For the JP-8 itself, JP-8 as a whole, we're going to use GC mass spectrometry. We'll probably have to go to a technique called selected ion

monitoring for the higher risk components like benzene and some of the xylenes and other components that are in JP-8, so the analytical techniques are as sensitive as available. And we additionally have high resolution mass spec if we need it.

UNIDENTIFIED MALE: And your collection method will collect virtually anything acidic?

MR. BREWER: That's why we selected charcoal, yes, sir.

UNIDENTIFIED MALE: Got you. Thank you.

UNIDENTIFIED FEMALE: I think you probably answered the question that I had. Earlier, I guess you mentioned that some compounds, the ESL detection limits. Are those any compounds that have a risk?

UNIDENTIFIED MALE: Yes, benzene specifically. And this is the whole reason for modeling this stuff first before we site the locations, because we have to assure ourselves that we can sample the background and get a background number that will allow us to tell the difference between background and low parts per billion for these individual components like benzene, and we have to get a statistically valid number that says yes, you do have the detection limit to differentiate three parts per billion or five parts per

billion.

UNIDENTIFIED MALE: The real problem here is when you look at actual urban atmospheres for like benzene, they range from like ten to a hundred, and yet the limit that supposedly you're supposed to release is three, so you're trying to see a very small difference in a large background. And you know, statistically, that's very difficult unless you take hundreds of samples and, you know, this study is not of the scope or the money is not available to do these large samples, so what we're trying to do is try to maximize everything possible to see the greatest difference that this operation has.

If we can't see anything over, you know, background, which naturally varies; you know, the wind changes and it heats up in the day and you have to sample over sufficient period of time to get enough sample, you know, to get enough material in that absorbent that you can analyze. We're going to be pushing the limit.

MR. BREWER: The thing, in summary, the goal of this study is to assess JP-8 fueling operations, current JP-8 fueling operations, the impact on North Kelly Gardens. It's complicated by high background, as we've been discussing, and then we have to assure

ourselves that our measured values will be distinguished from that background.

A good example is the background we measured at Southwest Research doing the method development studies was around ten micrograms per cubic meter. The ESL for benzene is three. So what that says is you've to be able to statistically say that ten is different from three, and that's the problem we're up against.

UNIDENTIFIED MALE: What other conditions will effect the weather conditions themselves? Do you have a sliding scale also for barometric pressure or do you have consideration for barometric pressures?

MR. BREWER: As far as calculating the risk, I'm not familiar with the calculation techniques. As far as the environmental parameters we're sampling, we're going to look at relative humidity, barometric pressure on the hour. I think barometric pressure is reported every 15 seconds and the average is given to you whoever you want it.

Relative humidity, we're going to have to measure manually, but yes, it will be recorded, and if it's called for in the risk calculations, then we'll certainly use it.

UNIDENTIFIED MALE: Two questions.

You're going to do this worse case scenario of actually pumping gas or JP-4. Will you simulate a spill?

MR. BREWER: What we're going to simulate is the normal operating conditions at system 1592.

UNIDENTIFIED MALE: You know, it seems to me that worse case would incorporate some kind of a spill, since spills occur.

MR. BREWER: We're looking at the operating system at 1592, and although you may have spills, that would qualify as an emergency situation, and I would think that if you did have a spill, the response would be immediate to recover from that situation, and there's really no way to go in and purposely determine what a spill is going to do.

UNIDENTIFIED MALE: I guess then we're really not talking about a worse case but we're talking about a worse case when accidents don't occur?

MR. BREWER: No, I said worse case operating conditions, operating.

UNIDENTIFIED MALE: Yes.

UNIDENTIFIED MALE: Basically this is, when you do a health risk assessment, then is an emergency or an accident situation, you're basically trying to look at is there a potential that the operation would have an impact on the community and

based on the emissions. So obviously that's a calculation of what you do. You take the situation and be able to predict over a long period of time whether or not you accumulate it.

UNIDENTIFIED MALE: Yes, sir?

UNIDENTIFIED MALE: I think I understand most of what you said, talking about a specific facility and its potential impact. There must be some reason why we're even looking into it. Have there been complaints or has there been some demonstrated -- because that's what I don't -- that drives the need to do this? Regardless of where the source is, there's a problem.

MR. BREWER: What I tried to emphasize, and hopefully I did, is we're going to look at current conditions, normal operating conditions associated to JP-8 or effects relative to JP-8, which the release rates and the model concentration, and the whole assessment can be backed up to look at JP-4, whatever you'd like to look at, but you're going to have to use historical data to do that.

UNIDENTIFIED MALE: Will the residents be notified some days of ahead of when the sampling will be done?

MR. BREWER: Well, there's actually going to be two events. We're going to do the fugitive study

with system 1592 first, and that will probably be conducted along Berman Road outside of the property boundary. We'll have a facility there. And then I'm estimating a couple of weeks and then we would be in the neighborhood.

UNIDENTIFIED MALE: Uh-huh.

MR. BREWER: So I would probably look to our client to notify the residents.

UNIDENTIFIED MALE: Will you plan on doing that, Larry, notifying the residents?

UNIDENTIFIED MALE: Absolutely, just like we done the soil sampling and the other thing. You bet you.

UNIDENTIFIED MALE: And my last question is how much will this cost?

MR. BREWER: Ask the people who pay the bill.

UNIDENTIFIED MALE: It costs a lot of money.

UNIDENTIFIED MALE: Do you have a rough idea?

UNIDENTIFIED MALE: We can get you a range.

UNIDENTIFIED MALE: Could you have an estimate at the next RAB meeting?

UNIDENTIFIED MALE: Sure.

UNIDENTIFIED MALE: Thank you.

UNIDENTIFIED MALE: I'll give you a range of what we're doing, because it could be this, it could be that. But I think that's an important point, and it's an important point to, while the people in the community, some of whom, you know, obviously are saying that the problems are coming from Kelly, you know, the studies that are being conducted now are very thorough. There's more than just a party who's looking at them. There's Southwest Research and others. I think that's important. We're going to start to make sure that the information that we get out to the community, that they understand that there are multiple parties that are looking at this.

We're not going into the cost with specific members of the community unless asked because then we'll give them a range. The key is there are people out there that have said we have definite health problems and we think that some of them are, in fact, being caused by Kelly Air Force Base.

So once again, the soil -- back to your question, sir -- the soil sampling was directed at that concern. The air sampling is also directed that concern.

UNIDENTIFIED MALE: Okay, thanks.

MR. BREWER: One thing I would like to interject is there is a test plan that will be finalized before we do the sampling, which will probably explain things in much greater detail than I did.

UNIDENTIFIED MALE: Will we have access, will we be able to look at the test plan beforehand?

UNIDENTIFIED MALE: We'll do it the same that we did the soil sampling, by going out and talking about the points and --

UNIDENTIFIED MALE: Yes, that was very well done, when we sat down and looked at the sampling points, yes, that's a great model to use.

Thanks, that was a great presentation, Joe.

UNIDENTIFIED MALE: Pardon me, if I could make a quick comment.

UNIDENTIFIED MALE: Yes.

UNIDENTIFIED MALE: Since their presentation is complete, I'm not saying that you have to leave, but if you want to leave --

UNIDENTIFIED MALE: Or you can stick around.

UNIDENTIFIED MALE: Can we just have a break for about five minutes?

UNIDENTIFIED MALE: I was going to ask, folks, if they prefer, we have an hour and a half and we've done two out of three. It looks like people are voting for a break.

UNIDENTIFIED FEMALE: Five minutes.

UNIDENTIFIED MALE: Yes.

(Break taken.)

UNIDENTIFIED MALE: Okay, let's get started. SAIC is going to talk about plans for cleaning up Zone 3, in particular, Quintana Road neighborhood, and I'm very happy to see the SAIC folks here because this is a meeting we've been asking for for going on a year now and I'm glad it is final here. So thank you and turn it over to Bob.

UNIDENTIFIED MALE: Everybody should have the hand-out that I'm basically going to go through page by page. With respect to drawings, I'm going to utilize, because of the graphics that's available here locally, I'm going to utilize that particular drawing over there to show and locate where it is the areas that I've been speaking in terms of.

What I'm proposing to do is obviously address and present those areas or those locations that were proposed and accepted as the RODS for the ground water remediation systems in Zone 3, and so what we are,

in fact, doing is obviously following that particular ROD. And then I'd like to give you a current update or a status of where we stand currently with respect to the initiation of working into the installation of those particular systems.

UNIDENTIFIED MALE: I'm going to ask a question about the acronym. What is a ROD?

UNIDENTIFIED MALE: Record of Decision.

UNIDENTIFIED MALE: Okay.

UNIDENTIFIED MALE: In other words, it's gone through the process of being regulatory approved.

UNIDENTIFIED MALE: I just didn't know what a ROD was. Thank you.

UNIDENTIFIED MALE: All right. And at the end -- yes, I'm going to utilize this. That's the Zone 3 graphics and so that's the area that we're talking about.

What I have here as well, for purposes of being able to demonstrate, this is the particular drawing or the graphic that's come out of the actual normal document that says these are the preferred alternatives and this is what has been accepted as far as the ROD. So I want to use this. Obviously that's not what's on that particular drawing but what we've got here is obviously the site.

With respect to that particular document and the ROD, these are the particular locations that were identified within Zone 3 for remediation.

With respect to this particular drawing over here, this site here is MP. It's the solid plating facility at the Berman Road/Tinker Road intersection. If you were to take Tinker straight down into Berman Road, what is left of the vacant lot or parking area, to the left as you get to Berman Road, site S-8, if you were to go down to the same location and turn to the right, you come to what was known as one time as the (Inaudible) facility, and that's known as S-8. S-4 was the location of where, in fact, fuel was encountered during the process of the city's excavation of a storm sewer system down in the Quintana Road area.

In the process of activation, fuel filled that area, and as a result, there was a particular fuel plume that they had to deal with as far as cleaning it up.

The other location is site S-6, which is up in this particular area, you know, proposed park in the center of the maintenance complex of the base. And those are the principle areas.

And then with respect to the preferred alternative, as you would look at it, there's another

proposed, for lack of a better term, I didn't know what else to call it other than Union Pacific Railroad Recovery System.

Within that particular plan, it was presented that there would be a capture system installed to address this particular plume area out in this particular area, just outside near the railroad plume, the UPRR location.

UNIDENTIFIED MALE: Bob, I want to say something.

UNIDENTIFIED MALE: Yes, sir.

UNIDENTIFIED MALE: I don't want to, you know, discourage you from talking about any of this stuff you had planned talking about, but those of us who requested this, we were almost entirely interested in the Quintana Road neighborhood area. Now certainly if people are interested in other things, you know, talk about it, but it might make things go faster, if it's agreeable to you and everyone else here, to essentially focus on Quintana Road.

UNIDENTIFIED MALE: I think you would be cheating yourselves. As the RAB, you have a job, and that is to look at the remedial systems that are being planned or look at the contaminants that we're trying to address here and then evaluate the remedial systems that

are available and help provide the input to the process. That regards to the whole base, no focus areas, not spot spots necessarily, all the remedial systems, and tonight we're focusing on Zone 3.

UNIDENTIFIED MALE: Yes, what we're doing is focusing specific to Zone 3. That's what we were asked to present and that's what we are, in fact, presenting.

UNIDENTIFIED MALE: Okay.

UNIDENTIFIED MALE: Now about Quintana Road, you're talking about the UPRR areas?

UNIDENTIFIED MALE: Where are you addressing? Are you addressing down here?

UNIDENTIFIED MALE: Yes. It's essentially the contaminant plume in the neighborhood that extends something like so.

UNIDENTIFIED MALE: Okay.

UNIDENTIFIED MALE: Yes, we, in fact, are not proposing to discuss anything with that particular area, other than the fact that what we're dealing with is the preferred alternative is basically this particular system that was installed out here. As a part of our tasking, we're optimizing that particular system to allow that system to work efficiently or more efficiently than what it currently is, but as far as

doing anything to address the plume out in here, we, as a part of our tasking, are not dealing with that.

UNIDENTIFIED MALE: Well, I guess there's some crossed wires here. Our request went through the Air Force and to you and it didn't get transmitted the way I hoped it would.

UNIDENTIFIED MALE: We'll address that to some degree, so we'll get to that, unfortunately in our last site, but we will get to it.

UNIDENTIFIED MALE: We're going to address what we're proposing to do in that particular area, I'll tell you that.

UNIDENTIFIED MALE: Is there another contractor then that's working on designing clean-up system for the neighborhood itself?

UNIDENTIFIED MALE: I can't speak to that exactly. I know that we are not. I know that this particular plume here is being handled through a particular effort that's associated to Zone 4 activity.

UNIDENTIFIED MALE: Okay. Well, I don't want to hang you up any more.

UNIDENTIFIED MALE: So really to get into what we're talking about, with respect to cite MP, as we have indicated, that's the plating facility that used to be located in here, of which this particular plume is

basically associated.

The general approach that we're following is we have, where, in fact, possible, we are looking to utilize the design vehicle as a means of actually the installing the remedial action so that we aren't just designing something that, in turn, somebody at a later date will go out to a point of actually constructing, so that's the intent that we're following with respect to how we're proposing to do all the site work.

The other is we're applying, for the most part, the same technology that was approved within the ROD.

The other is we're looking to integrate obviously the soils with ground water. In other words, we aren't looking to install a system that's specific to either/or. We're looking to ensure that we've got a system that's totally compatible from a source mitigation as well as a ground water mitigation system. And other is, in fact, we're looking to optimize the existing systems that are already there without going back and necessarily rebuilding those systems.

UNIDENTIFIED FEMALE: I'm sorry, when you said same technology, is that the pumping it out and cleaning it up?

UNIDENTIFIED MALE: Yes, yes, ma'am.

UNIDENTIFIED MALE: Now a couple of things that we're doing here can have some effects. First of all, especially with combining remedial designing with remedial action and also with the optimization perhaps, and the integrated system, though, three things are, first of all, cutting down significantly the time that takes to get the systems accomplished and completed significantly, especially combining (Inaudible) design with remedial action.

Secondly, it's also providing the maximum efficiency you can. And I'm use the term design/build.

UNIDENTIFIED MALE: I was going to say design/build.

UNIDENTIFIED MALE: We all know design/build is the most efficient way of doing it. Now sometimes you have to be careful with the government because you have to be careful with the design/build, but in this case, we're proposing that because certainly things have changed in the last three years when the, three to five years, when the feasibility studies were done, societies conditions have changed, plumes have moved, et cetera, so by doing our testing here for the remedial design and then we come right in, boom, and as a part of design action and the optimization actions that we're doing, the final system gets put in place,

you have absolutely put in the best system at that time and you have also cut the amount of time it takes to get the system in.

And also, I'm not going to bet my life on it right now but I'm almost do that, in terms of by optimizing, we're going to be cutting down quite a bit the number of years it takes to clean up the plume. And there's a lot of details in that that we don't have time to go into now but we probably will down the road in terms of how this optimizing will definitely, as we do the modeling that you'll see here, will show how we're talking about significantly reducing the time.

UNIDENTIFIED FEMALE: Did you re-do the modeling?

UNIDENTIFIED MALE: No. We will be re-doing it.

UNIDENTIFIED MALE: Do you have an estimate of clean-up time now?

UNIDENTIFIED MALE: No, we don't. That's what we'll be doing as part of this effort for each site.

UNIDENTIFIED MALE: And with respect to MP, which is the old plating facility, we are in the process currently and currently under schedule that as of the 21th of this month, I don't know if there's been

some kind of release, but we'll be installing what could be the first of one or two wells. At this point, we don't know exactly how many, within the site of MP.

The previous system, the interim system that was put in there to address this particular plume that is migrated off the base was a system installed for a problem that was being experienced at the time. They wanted to initiate an action to prevent this particular situation from getting any worse so there was basically a system of five recovery wells that were installed along Berman Road along the base boundary line. That particular system has been operating for approximately two years.

What we're proposing to do as a result of the BRA, I'm not -- the Basewide Remediation Assessment that's been being done now for the last three years -- we have been looking at that particular data. This particular design or the interaction was designed back in '92, '93, based on much different data that what, in fact, is available to us to date.

UNIDENTIFIED FEMALE: Do you think it worked? I mean, was it successful?

UNIDENTIFIED MALE: Yes. The system, from a containment standpoint, it obviously is doing nothing with respect to the plume that's already gone

beyond the boundary.

UNIDENTIFIED FEMALE: Right, right.

UNIDENTIFIED MALE: But with respect to containing the plume and what we've been able to identify, actually the source, of which this system was never intended nor was it intended as part of the preferred alternative to do anything with the source because it wasn't assumed that there was one, we have identified within -- there's a dissolved plume that exists within the MP facility or within that particular area that probably has the highest concentrations of TC and PC that's located on the base but that's not going anywhere.

Over the last three years, that particular source has remained within this particular boundary. What we're proposing to do is rather than just stay with a containment system, evolve that system into a source mitigation system, basically making it more of a capture source removal system than what it currently has been set up for.

UNIDENTIFIED MALE: Bob, based on the data that you've seen, do you think that source is still being produced or is it just a remnant of an event that occurred in the past?

UNIDENTIFIED MALE: All we can see --

That particular question, we can't totally answer that but there certainly is a ground water plume that's not moving that is, in fact, located in what was the location of what the building used to exist in. I can't sit there and say that there is, in fact -- We've done and the base has done some particular soil sampling to this area and there's not been any kind of indication within the soils that there's any kind of contamination process. So whatever is present, it would have to be sub-surface.

There's the possibility that this particular source material is as a result of the industrial waste collection system that used to exist in that particular area, but the system, there's a concentration of chlorinated solvents that, in fact, has not moved in a three year period of time. So in order obviously to address the problem to mitigate the source, you have to attack it, and that's what we're proposing to do, and in that particular first recovery well, we're calling it right now a test well but we, by our design, are setting up our wells in such a way that they will become a part of final system.

The first of those wells will go in next week, and that will be installed in what we have identified to be the source area, and that's what we're

basically talking about with respect to pump testing.

UNIDENTIFIED MALE: That's a key element of what we talked about integrating remedial design with remedial action, in that we need to determine --

(Tape cut off. End of Tape 1.)

(Beginning of Tape 2.)

UNIDENTIFIED MALE: What is the primary purpose of the pump test? I understand you're going to later look at hydraulic characteristics. Then what are you going to do with it?

UNIDENTIFIED MALE: We're going to verify that we can, in fact, capture from that one well the source. That's the whole purpose of that particular pump test. We want to determine what, in fact, the radio influence of that particular well to ensure that we have complete capture of that source area.

So the other thing is, and we'll go into this. In fact, we'll evolve into it. As you can see from a proximity standpoint, S-8 is very close in proximity to this location. You can't eliminate what it is that's being done here that's not going to have an effect on this particular system. These two systems have to be integrated.

When the systems were initially put in and installed, they were put in separately, apart from one another. Input information was basically from this area that allowed the model to be developed to put in that particular system. This system was put in, I believe S-8 was put in sometime around in '92. This system here was in '94, so there's a couple years apart

within that system. This is back in the '90 to '91 time frame with respect to S-4. So those were put in with respect to information that was available.

The BRA data, which is basically a data that's capturing far more wide-reaching areas for other than specific to the sites, didn't begin until about 1994 and it's gone on each year. So there wasn't any kind of larger picture information available so the BRA information was, in fact, for that particular task began back in '94.

So with respect to the wells that we have been installing in the source area, it has a very good potential, just because of the thickness of water that's within this particular area that could, in fact, influence the operation of this particular system here. So what we have to do, in the process of putting together this design is we integrate obviously this system into this system from a ground water standpoint.

UNIDENTIFIED MALE: We have the official aquifer and then we've got the Navarro underlying that.

UNIDENTIFIED MALE: Yes.

UNIDENTIFIED MALE: Are you only looking at the contaminants in this official aquifer or are you doing anything with the Navarro?

UNIDENTIFIED MALE: We've gone and mapped

the Navarro. We have done and will be doing, when we talk about, that's the next step that's being proposed that we're going to be doing.

Contamination, and as pretty well indicated by this particular drawing as well, you know, contamination is basically a tracer. That's a tracer of channels. In other words, contamination is going to move through channels. What was not ever really identified in the paths was where exactly are those channels to ensure that the systems that have been installed are located in the best place possible to capture that contamination.

UNIDENTIFIED MALE: I was going to say something a little bit different, and that was generally the Navarro was thought to be almost impermeable.

UNIDENTIFIED MALE: Yes.

UNIDENTIFIED MALE: However, in some places, it is quite permeable. So are you looking at --

UNIDENTIFIED MALE: We're looking at the Navarro at being the bottom of the shallow water. We're not going below that. That's the extent of it.

UNIDENTIFIED MALE: So do you believe that the Navarro is not contaminated or that there's no possibility of the Navarro being contaminated?

UNIDENTIFIED MALE: You mean

contamination as migrated below that particular --

UNIDENTIFIED MALE: The Navarro from this official aquifer?

UNIDENTIFIED MALE: No, we do not believe that and we don't see that there's necessarily any information that dictates that that is the case. There's another project that's ongoing that will be starting to potentially further address that possibility.

UNIDENTIFIED MALE: Do you have data that shows you that, in fact, the Navarro is not contaminated? Do you have data that show that?

UNIDENTIFIED MALE: No.

UNIDENTIFIED FEMALE: That's an assumption.

UNIDENTIFIED MALE: No, that's an assumption. It's based off of this information that's currently available.

UNIDENTIFIED MALE: Yes.

UNIDENTIFIED MALE: Okay. Now from a standpoint of our systems, obviously we're addressing these systems with respect to the clean-up of the shallow or superficial aquifer.

UNIDENTIFIED MALE: And that's all we'll be talking about today?

UNIDENTIFIED MALE: Yes.

UNIDENTIFIED FEMALE: Is there any (Inaudible)? I just kept calling it the shallow aquifer.

UNIDENTIFIED MALE: That's all we know it as.

UNIDENTIFIED MALE: Could I just bring that up as a point for future consideration? In some places, Air Force data shows that the Navarro is more conductive, has hydroconductivity several orders of magnitude than some portions of this official aquifer, so I don't know that we can get completely away from the assumption that we don't have to think of contamination in the Navarro. I think we may have to think about it. Right now, it's an unknown.

UNIDENTIFIED FEMALE: Given the risks associated with the (Inaudible), it's pretty serious.

UNIDENTIFIED MALE: Yes, the problem is that the Navarro, there's no barrier to flow between the Navarro and this official aquifer, so what you can have happen is contaminants flowing in this official aquifer, then if the Navarro happens to be more conductive at a certain point, flow into the Navarro and then move back into this official aquifer.

UNIDENTIFIED MALE: Okay. So that's what

I was wondering. You're talking about the Navarro as a source agency?

UNIDENTIFIED MALE: Pardon me?

UNIDENTIFIED MALE: You're talking about the Navarro as a sourcing agent? In other words, it becomes contaminated and then resources?

UNIDENTIFIED MALE: That's one possibility, yes, that's one possibility.

UNIDENTIFIED MALE: But I was thinking you were talking about actually breaks in the Navarro and going down into the Edwards.

UNIDENTIFIED MALE: No, I'm not referring to that. I'm just referring to the aquifer portion of the Navarro now, but that's another issue and that's for another day.

UNIDENTIFIED MALE: Okay, we'll check into that. We'll have our hydrogeologist address that and look at that. I haven't heard that come up before.

UNIDENTIFIED FEMALE: You know, your clean-up --

UNIDENTIFIED MALE: As far as, yes, there's not been much information that I'm aware of anyway that shows the Navarro as being a sourcing agent.

UNIDENTIFIED MALE: Yes, I have actually looked for water quality data on the Navarro.

UNIDENTIFIED MALE: Okay.

UNIDENTIFIED MALE: And I haven't found any. I've found aquifer testing done on the Navarro but no water quality data for it. It probably exists somewhere, I just don't have it in my 40 pounds of stuff.

UNIDENTIFIED MALE: We'll check into that.

UNIDENTIFIED MALE: So obviously a part of our tasks, and again, when we talk channel delineation, and that's being done in basically two forms of geophysical techniques.

The size posts, which some of you may be familiar with, was already conducted, and that work was done this past fall.

It was found to be very good with respect to delineating the particular, the surface of the Navarro, but it was found not to be very well -- it doesn't do very well with respect to characterizing lithology nor determining whether or not gravels are, in fact, present.

Obviously with respect to any kind of a channel, there's got to be some kind of gravels present to allow water to be existing. You can find a low lying area within the Navarro but if you don't have some form

of gravel present, then you're not going to have potentially any kind of mobility within the water flowing through that particular area. You have to have a channel.

UNIDENTIFIED MALE: I completely disagree with that. In order to get ground water moving, you need a translucent medium and a difference in hydraulic heads.

UNIDENTIFIED MALE: But also translucent medium, it's generally some form of permeable material, whether we want to call it gravel or whatever you want to call it.

UNIDENTIFIED MALE: What he's talking about is you'll get the greatest flow and you'll get the largest flow in these graveled areas.

UNIDENTIFIED MALE: I don't have a problem with that, but where you have ground water and where you have difference in heads, you have to show --

UNIDENTIFIED MALE: Absolutely.

UNIDENTIFIED MALE: Absolutely.

UNIDENTIFIED MALE: We're just talking about the gravels of where we're going to optimize our systems, that's what we're looking for.

UNIDENTIFIED MALE: And that's the point behind the geophysical work that's being done, because

we obviously want to ensure that the current systems that have been installed are in the most optimum locations possible, so that's part of trying to identify where the channels are to ensure that those wells are located in the best suitable locations for purposes of capturing that particular contaminant plume to ensure that, in fact, it's not going to do anything with respect to the plume.

It, in fact, has gone beyond the base but it certainly is going to prevent any future movement of any contaminant plume beyond the base boundary.

The next is with respect to the existing systems, there's never been, to date, any kind of an actual physical test of those existing systems. There's been some capture modeling that's been being done but that's based off of actual, basically information that's available from sampling that's done, water level information that's captured as a result of BRA. There's not been any kind of physical pump testing of those existing systems, so what we're going to do as a part of this, we'll be pump testing each of those particular wells within the containment system, so the five MP wells will be tested to determine exactly what it is currently that's available within that system. And then at that point, that will begin, we'll plug that into our

model with respect to the information we obtain from the capture system as it currently stands, and from what we determine to be the need from the source mitigation system, we will develop a containment system that will, in fact, address this particular MP site.

And at the same time, when we indicated we were proposing to do this in a design/build concept, once, in fact, the wells are in place, we would at that point come back and install the infrastructure which supports those particular wells.

By infrastructure, I'm speaking of obviously all the piping network that's required to take that particular ground water down to a treatment facility on base. So we, as a one process type integration, once we develop the particular system, we will, in fact, install the piping system that's required to move that ground water down to the plant.

UNIDENTIFIED FEMALE: Now is your system going to be limited in any way by the capacity of that treatment center, the power treatment plant?

UNIDENTIFIED MALE: The power treatment plant?

UNIDENTIFIED FEMALE: Yes.

UNIDENTIFIED MALE: No, because that particular ground water treatment plant will be upgraded

to the point that it will receive whatever the ground water is that we have determined the need for.

UNIDENTIFIED FEMALE: Okay.

UNIDENTIFIED MALE: And they're in the process of doing that as well. There was a draft plan designed that was provided to the base for upgrade and integration of those systems.

The ground water treatment plant right now is currently technically two individual systems. Zone 3 comes into one side of the plant, Zones 1 and 2 comes into the other. They operate as independent systems. We have provided to them a design package that would allow that particular system to integrate itself so that they have the ability of surging from different systems, from Zone 1, Zone 2 and Zone 3, and accommodating that particular surge, and they're in the process of upgrading or moving to the upgrade of that facility.

UNIDENTIFIED MALE: Some people are concerned that this pumping might cause subsidence and damage to their homes. Have you done any studies to look into that?

UNIDENTIFIED MALE: No, we're not doing that, no. But the whole point is we're not de-watering for the sake of, you know, we're not just massively

drawing water. I think there may be a misconception that we're just pumping, you know, as much water as can be pumped. That's not what you do for purposes of establishing a capture system. You pump enough water that your cone and depression is basically capturing the particular flow that's coming into it. So we're not, by any means, de-watering the particular system. That has never been the intent and nor is it going to become the intent of the systems.

UNIDENTIFIED MALE: You want to be sure not to pump clean water.

UNIDENTIFIED MALE: That's the other point too. That's why it is you want to optimize the locations of the well, so that you are, in fact, reducing that particular issue, that you're not pumping a lot of clean water that you're having to process and treat, which is fairly costly.

And then the last thing that we would do is once everything is in place, we would do an actual test of the system to ensure that, in fact, it's doing what it was it was modeled and intended to do, which is something that has not been done as well before. So we're going to verify what it is that's in place is working and is working the way it was designed to work.

And with respect to site S-8, again, the

same thing. As I had already mentioned once before, S-8 merges into or has got to be integrated into the design of MP, so from a ground water standpoint, it's going to be evaluated along with MP.

As we conduct our particular tests associated in the installation of the recovery wells at MP, as well as with respect to the system that currently is working within those MP wells, we're going to be doing the same type of pump testing of the existing system.

It's our belief that right now there's a lot of wells that currently have been installed as a part of S-8 that aren't necessarily required for purposes of maintaining the capture system that we need to have with respect to (Inaudible). Some of those wells are currently located on railroad property.

Just for purposes of O and M and maintenance, long term maintenance, it's much better if, in fact, you can develop a system that's going to, in fact, provide you the same recovery, same capture with lesser wells that you have to deal with and service over time. So we believe that, in fact, is what's going to be the case, so that's part of our optimization.

We're going to go in and determine what, in fact, is actually needed with respect to the

installation of the wells that we're going to be putting in here, and with respect to these wells operating, what, in fact, is still required to be operating here to address containing that particular plume that's associated with S-8.

Now along with S-8 --

UNIDENTIFIED MALE: I'm sorry, but not only contain it but the optimization will speed up the recovery of the plume, not just passing containment but also we want to optimize these wells.

In the past, the wells have not been optimized for a lot of different reasons and what we're going to be doing is we'll be optimizing screen size and things like that. The screen sizes in the past have been like size ten. We're finding that screen size of about 80 or even a hundred, and so therefore you can imagine that we're going to be maximizing flow quite a bit, a lot more flow, and that's going to help us clean things up a lot faster.

So where models in the past have used data correctly but it's old data, we're going to be optimizing things and the flows are going to be greater, and that's why we predict that when we finish here, the models are going to tell us, you know, where it said 30 years before, maybe we're down to 15 or whatever, we're

fully anticipating that.

UNIDENTIFIED MALE: As you optimize, you have to take into account other wells that are pumping in the area.

UNIDENTIFIED MALE: That's exactly correct.

UNIDENTIFIED MALE: And presumably there are going to be other wells out in the neighborhood working to clean up the contaminated plume in the neighborhood. So that's why I'm a little bit surprised that you all not only aren't planning on doing it but you don't know who it is you're going to have to work with in order to optimize your system.

UNIDENTIFIED MALE: No, there's a system. When you say neighborhood, there's work that's going on out here. I'm just saying we're not doing that. I know that CH2M Hill is doing that.

UNIDENTIFIED MALE: CH2M Hill is doing that?

UNIDENTIFIED MALE: Yes, with respect to the Zone 4 activities, CH2M Hill is working with respect to the plume that, in fact, has gone beyond the base.

UNIDENTIFIED MALE: And would they be doing it down in the Quintana Road neighborhood as well?

UNIDENTIFIED MALE: I can't answer that.

I'm not sure.

UNIDENTIFIED MALE: Do you know, Mike?

UNIDENTIFIED MALE: No, I don't. I mean, I assume so but I don't know.

UNIDENTIFIED MALE: Okay.

UNIDENTIFIED FEMALE: (Inaudible).

UNIDENTIFIED MALE: Have we done briefing, no, no. We have provided the information. Now whether the folks with the (Inaudible), I can't speak to that. We specifically haven't.

UNIDENTIFIED FEMALE: Who else would be likely to do it, you said?

UNIDENTIFIED MALE: The EMRO staff?

UNIDENTIFIED FEMALE: Oh, okay.

UNIDENTIFIED MALE: The Kelly staff. I don't know what they have given to those folks.

UNIDENTIFIED FEMALE: You think there's any (Inaudible)?

UNIDENTIFIED MALE: You're speaking in terms of the storm sewer project?

UNIDENTIFIED FEMALE: Uh-huh.

UNIDENTIFIED MALE: I don't think so. I think that from a hazard standpoint, I believe the hazards have been identified with respect to its potential and with respect to the construction of that

particular site. Is that what you're concerned about?

UNIDENTIFIED FEMALE: Yes, that that might mess with what you all are doing.

UNIDENTIFIED MALE: No, no. We're talking about a system that is really -- that particular system is going to run through here and through here. That's the storm sewer system you're speaking of.

UNIDENTIFIED FEMALE: Uh-huh.

UNIDENTIFIED MALE: And right now, this is the actual product plume. That's what this was drawn by.

UNIDENTIFIED FEMALE: Uh-huh.

UNIDENTIFIED MALE: The dissolved portion of that plume, as I understand it, is really in the area of this particular site, but at much lower levels than what presents itself as any kind of hazard, as I understand it, but precautions, as I understand it, as well with respect to the city, I can't speak to exactly where the (Inaudible).

UNIDENTIFIED FEMALE: Maybe I used the wrong word but what I meant was --

UNIDENTIFIED MALE: Interfere with us?

UNIDENTIFIED FEMALE: Yes, interfere with what you all were doing.

UNIDENTIFIED MALE: No.

UNIDENTIFIED FEMALE: Okay.

UNIDENTIFIED MALE: No, their project is going to go on that we would not have any interference with what we're proposing to do.

UNIDENTIFIED MALE: Yes.

UNIDENTIFIED MALE: Yes.

UNIDENTIFIED MALE: What's the nature of the contaminants we're talking about? What are they?

UNIDENTIFIED MALE: Okay, just to give you an idea, this particular site here was a plating facility, basically chlorinated contact solvents, contact cleaners is what was used in this particular site, PC, TC type contaminants.

UNIDENTIFIED MALE: Okay.

UNIDENTIFIED MALE: S-8 is two sources in that. Technically there was an underground tank fuel source contamination that was identified within this area, and that's what the initial response was associated with.

There also was what was called the green worm, which was a conveyor system that went from the base boundary system, and there were some concrete tanks right along the fence line that contained solvents and these particular parts would come across from the building across the road, come into the dip tanks, and

then go back, and that's why it was known as a green worm. It was a conveyor belt system that would run from one building to the other. And so you've got solvents and fuel combinations in this particular an area.

In this area, the principle source initially was fuel, and that was what was uncovered when, in fact, the city started the initial construction of that storm sewer, you know, system right along Quintana Road, it was in this area here, and they encountered the plume and the construction was stopped.

UNIDENTIFIED MALE: S-6?

UNIDENTIFIED MALE: S-6 again is a maintenance, and again, that's solvents.

UNIDENTIFIED MALE: Are these plumes that you've identified, have they already presented a hazard or are they simply there and you're going to have to get rid of them?

UNIDENTIFIED MALE: They're a source of contamination of the shallow aquifer. The intent here is obviously to do what we can do to mitigate that source as much as possible.

The aquifer itself will, over time, obviously if you had a lot of time, will clean itself if it didn't have continuing sources, if, in fact, so what we're trying to do is obviously attack what we see as

being those source areas and then obviously do the containment or be sure that we've got complete capture so that nothing, in fact, is going to go anywhere else, and then we'll facilitate the cleaning of the base.

UNIDENTIFIED MALE: Bob, have you gotten metals anywhere?

UNIDENTIFIED MALE: Metal contamination is not significant. Now with respect to S-8, metals has never been identified as a problem there with respect to anything that's off the base.

Now with respect to on the base itself, there's soils or source area actions that are going to be taking place. In the case of S-8, that particular location was identified for capping. In other words, as well as the installation of a push/pull soil vapor extraction bating system to be installed in this particular area to address product that's located within this particular area. So what we're doing is we're integrating. That's what the next step was that I was going to talk about, the integration of the soils in the ground water.

Previously those systems were looking to be somewhat independent of one another. Soils was going to go in and they were going to put this in, and then you're going to deal with your ground water as

secondary. Both have to be combined. I mean, you've got to be looking at those particular systems as a unit and that's what we'll be looking at. In other words, we're looking at proposing a dual casing type system where basically you're going to have a ground water recovery system with a vapor extraction system in one location for purposes of mitigating the source.

In other words, we're allowing the system to interact and work together rather than having a system here and then a capture system here and not necessarily working with one another.

UNIDENTIFIED MALE: What sort of metals are you seeing?

UNIDENTIFIED MALE: I can't answer that, I don't know. Metals have never been identified, at least that I've been involved with, as being anything of importance or being any of the drivers behind anything of what's taking place.

UNIDENTIFIED FEMALE: Is that from the plating?

UNIDENTIFIED MALE: The metals?

UNIDENTIFIED FEMALE: Yes.

UNIDENTIFIED MALE: I'm not exactly sure what the source could be. The source could be any number of things but I'm not sure what the metals that

you're speaking of.

UNIDENTIFIED MALE: Just to let you know, there's some pretty high concentrations of chrome and nickel in some parts of the aquifer, like 10, 20 times above drinking water standards.

UNIDENTIFIED FEMALE: There's a plating company that's by my house and it's got like a lot of metal.

UNIDENTIFIED MALE: Yes, there hasn't been, that I'm aware of anyway, anything that's been identified that's specific that these systems are being installed to attack from a metals standpoint. The actions are basically associated to your solvents and fuels.

UNIDENTIFIED MALE: Just to make a comment, it's a whole lot harder to get the metals out than it is the solvents.

UNIDENTIFIED MALE: Agreed.

UNIDENTIFIED MALE: So that's something you need to look at.

UNIDENTIFIED MALE: Although your metals are a little bit less mobile as well as what your solvents would be as well, so mobility within the media is far less within metals. And within the metals, as far as finding a significant source, a plating facility

certainly could be a potential for that source but we have not found any indication or any particular source in the soils at all within MP. Everything that we've found is associated with actual dissolved product. You know, it's the dissolved portion that's actually in the ground water itself.

Did I already do S-4? S-4 again is the fuel situation.

Now it's not all fuel. There is, in fact, solvents that are, in fact, present down in this particular area.

With respect to the feasibility study, the feasibility study indicated that what we need is basically a containment system, of which that's what's been installed.

What we're proposing again here to do is do again the Navarro delineation so that we can identify channeling so that we can confirm the presence of channeling and see where, in fact, those systems are currently placed with respect to where it is that we see the predominant flow of that, you know, contamination moving so that we can ensure that the system is there to capture that prior to its being able to move off the base.

And at that point, we would put in

whatever the upgrades are that's required to allow that system to work how it should work in order to capture that particular plume so that it, in fact, does move off the base, and at the same time, install whatever infrastructure is required to allow that system to work.

It may mean that we do have to, in fact, add new wells. If that's determined that, in fact, there is an area that, in fact, is not being captured, we would at that point add the new wells for that particular capture to go on.

UNIDENTIFIED FEMALE: Do you think the containment in that area has been successful so far?

UNIDENTIFIED MALE: From what we can see, this particular product plume, this map here, as I understand it, is a number of years old and that dissolved plume, as I understand it in looking at the BRA's most recent, is way out in here, but I don't know that the actual product plume has really moved very much.

UNIDENTIFIED FEMALE: Okay.

UNIDENTIFIED MALE: And right now, that's where your system currently is installed is within that particular plume area.

UNIDENTIFIED MALE: That's why things will be determined just how efficient it's working.

Also we might be recommending or installing a product recovery system.

UNIDENTIFIED FEMALE: Are you going to give us updates?

UNIDENTIFIED MALE: We can give you updates -- (Inaudible).

UNIDENTIFIED MALE: When you use the term channeling, that's the same as (Inaudible)?

UNIDENTIFIED MALE: Yes, channel is really --

UNIDENTIFIED MALE: It's a different word than I'm used to regarding this but if that's the common word. I just need to learn if that's --

UNIDENTIFIED MALE: River channel.

UNIDENTIFIED MALE: Yes, river channel. It's a preferential flow path that water has a tendency of following, and it's already been proven that generally where the water flows is where your contamination is also going to flow and move.

UNIDENTIFIED MALE: It's just terminology. I just want to be sure I'm getting the right termination.

UNIDENTIFIED MALE: That's why if you've got a very good analysis of what the situation looks like here, I mean, if you've got a fairly reasonable

number of wells out here that you've analyzed, you can, by basically mapping your contaminants, you can, for the most part, to some degree identify generally where those contaminants are located, and we've looked at the BRA and that's what we've done for purposes of trying to initially determine where, in fact, are we located, at least what we seeing being the best locations currently possible.

For the most part, as you can see as well, the systems are reasonably there and that you've got the MP system here, you've got the S-8 systems here, and then you've got three legs of a system down here in S-4. So the initial system was put in there but what we're considering is it wasn't put in there based on real data that's actually, you know, mapped out the particular Navarro surface and then determined that it is, in fact, the most efficient well that could be, in fact, be constructed.

Then with respect to S-6, what we have here is a particular location that's not, to date, obviously there's not been anything that's been installed or initiated but what this is more into in line with our build/design concept. What we're proposing to do in this particular area, there was an eight well capture system that was proposed as part are

the rod. We're proposing to engage and basically build that particular capture system step by step.

In other words, we'll first come in and define where we believe the channeling to be best located in this area, install our first well, and we'll go into pump testing that particular well, determine what the radial of influence is that we can capture from that well, and from modeling, determine, where, in fact, we need to install the next well, then move to the next location, install that particular well, ensure that we've got the complete capture of that particular system and move right on down the system until we have installed that particular capture system that's required with respect to the plume that's present, and then at that particular point, we'll connect the infrastructure associated with that system and then plum it into the ground water treatment plant.

So we are, in short, constructing the system versus waiting and just proposing a design and then later come back and do it, and do it based off of a model, because that's the only way we could do it. We could basically go in with a pump test, and based on that information, model where we would see the next well locations being, but that's not optimizing the system. You're not going to give that to somebody else and he's

going to have assume this is where we put those wells. We're going to put the wells where it is that they need to be put for purposes of ensuring that we've got the complete capture of that particular plume.

UNIDENTIFIED MALE: Is that what design/build means?

UNIDENTIFIED MALE: That's what we're using design/build as.

UNIDENTIFIED MALE: It's concurrent rather than sequential, if you want to put it that way.

UNIDENTIFIED MALE: I think that makes a lot of sense.

UNIDENTIFIED MALE: It's not necessarily easy but it ensures speed.

UNIDENTIFIED MALE: Because what could happen is we could give a design and it would be two years later before you come out with the actual construction and then our design won't be as detailed, like I said, with what we're going to be doing, so that contractor would come out and need to do some testing and hopefully find out, and by at that time the plume is being moved.

UNIDENTIFIED MALE: Yes, that's exactly what takes place. The longer you wait, obviously the contamination at that point is moving not exceptionally

fast but it is, in fact, moving, so the system that was proposed two years ago may, in fact, not have the capture that's required to address that part of the plume that, in fact, has moved on, so that's why as you build the system, you are, in fact, building a system as you move along that you know is going to capture the system.

UNIDENTIFIED MALE: As you go along, based upon what's happening.

UNIDENTIFIED FEMALE: Does it make your design more accurate here?

UNIDENTIFIED MALE: Yes. The key word is optimization. It locates your wells. It also constructs your wells the best they can be constructed because we're following a procedure, we're going to put test borings in, we're going to basically take geotechnical data and analyze that so that we actually construct a well that's, by its design, is going to do what it needs to do for capturing that particular water body.

We're going to put the appropriate type of gravel pack around the well. We're going to identify the appropriate type screen slot size for the well. Whereas it would be different if you went, for instance, and we designed it and said okay, you come in here and

you just build all these wells this way and install your screens at this particular depths and use this particular slot size, it doesn't mean that that's how it is that it's actually going to work.

I mean, when you get in there, it may not perform the way that it is that you expected because you're basing that off of input that you provide in a model, and unless you physically are testing that particular well, you don't exactly know how it is that it's actually performing, so that's why we're proposing to do this and build a system as we go.

UNIDENTIFIED MALE: I like that idea. I think, if I understand what you're saying correctly, that would also mean that you really don't know how long it's going to take to clean up this plume until you're nearly done building the system, is that right?

UNIDENTIFIED MALE: For the most part. And --

UNIDENTIFIED MALE: However, after we've done a very rough correlation, I would think, after we've done MP and we've modeled that MP/S-8, and we're going to have modeled that while we're then going off and doing other sites, that's assuming we do them sequentially and not concurrently, then we're going to have to modeled that and come up with a prediction as to

how much faster that's going to go and we could apply that generally. Like if there is you know, a three to one reduction, we could say, gosh, we're hoping to get a three to one reduction with the rest of it.

UNIDENTIFIED MALE: What model are you going to use, do you know yet?

UNIDENTIFIED MALE: Well, we're looking at probably motion flow as being the principle model that we're going to utilize. That's the most commercially accepted and most everybody is utilizing it.

UNIDENTIFIED MALE: That would be within our GIS system also so our GIS system will be helping us throughout this.

UNIDENTIFIED MALE: So the optimization is, I guess there's three things that it keys on. Not only most importantly putting in the most efficient system, I think that's the most important thing. Also it's saving time in terms of getting the system in place and being the most efficient, saving time in terms of the ultimate clean-up and it's saving a lot of money, and I could name ten different areas where it's saving money throughout the whole process.

UNIDENTIFIED MALE: Have you all actually gone through this sort of process elsewhere?

UNIDENTIFIED MALE: We think this is a novel idea and Mr. Bailey has taken the chain all the way up to the Undersecretary of Defense for the Environment and Security, and he basically said "Wow."

UNIDENTIFIED MALE: There's been a general trend towards (Inaudible).

UNIDENTIFIED MALE: What I'm saying is, has this particular concept as applied to what's happening at Kelly in terms of the optimization and it turning into a final remediation system -- I mean, design/build is something that certainly is a concept of --

UNIDENTIFIED MALE: Right.

UNIDENTIFIED MALE: But as applied to clean-up of contaminants.

UNIDENTIFIED MALE: It's not been applied this way, that we're aware of.

UNIDENTIFIED MALE: A lot of the clean up projects are government and the government has a tendency not to like design/build because it's possible, it has the potential that the designer, if he's also the builder, he'll conspire with himself to design a (Inaudible), and you can say, "Well, geez, if I'm designing this, I may as well go for broke. Since I'm going to build it, if I build a ten million dollar

system, that's a lot better than me building a five million dollar system so I'll design a ten million dollar system."

But that paranoia is not worth the cost of breaking apart, plus breaking apart those two contract actions into two separate companies, if you've ever been to a construction site where the architect is standing there and builder is standing there and they're arguing about the same thing, they're all building the same house, you realize the inefficiencies of designing and then building. And the private sector has said, "Hey, this is great. It's a win/win." And government is, "Well, we just got to be sure we're wise about these tax dollars." It's the old spend a dollar to save a penny. But they're coming around.

Some sectors of the government are starting to say design/build, yes, maybe it does make sense. The Air Force is getting there.

UNIDENTIFIED MALE: And what we're doing is basically calling this optimization, we're not calling this design/build.

UNIDENTIFIED MALE: Technically this was originally proposed. We're running and operating the (Inaudible) systems.

UNIDENTIFIED MALE: You'll never see

design/build in this presentation.

UNIDENTIFIED MALE: That's the other thing. Paint a horse, you know, black and white.

UNIDENTIFIED MALE: So these pump tests you're proposing are actually part of this process you're talking about?

UNIDENTIFIED MALE: Yes.

UNIDENTIFIED MALE: That's what I say, we're doing it smart enough to where they end up to be the final (Inaudible), saving lots of money.

UNIDENTIFIED MALE: Now in the event, for instance, and that's why we're delineating. If we find wells that aren't installed properly or, if, in fact, we were to install -- The first well, you have to start some place based on the best information.

If, in fact, we determine that that well was not placed in the most appropriate location, then that well is, at that point -- our assumption is we're going to do all we can to place it where it needs to be based on the best information available.

Once, in fact, the well is installed and we do the pump test and we're not capturing or getting the response at the well we expect to get, then at that point, we would have to look to see what else there is for us to do to address and get a well in there that's

going to do what we need to have done.

UNIDENTIFIED MALE: But with the geophysics and with the geotechnical testing which hasn't been done before in terms of doing geotechnical testing prior to putting the well in, it's very important to find out what the slot size, et cetera. We think we're going to be free of risk.

UNIDENTIFIED MALE: The gentleman back there (Inaudible.)

UNIDENTIFIED MALE: I don't know if this even comes into play at all in our operating systems. They need to operate 24 hours a day and they need back-up and what not. If a pump fails, the power goes off for a period of time, is there any system here that you have anything for a back-up? I'm just wondering.

UNIDENTIFIED MALE: Yes. Well, we're involved with the whole process, which makes it sort of nice because we're also involved with the design upgrade of the plant facility and the control systems that are going to be located out at the sites that will have the appropriate alarm systems on them that trigger off what the reactions are if, in fact, something stops. Currently the systems are interim. We're now installing the final systems, so now along with the final systems, we're building that system so that we can work that

system.

UNIDENTIFIED MALE: You know, if a pump went out, I don't know how critical that would be, if you have order a replacement pump and get it in a month.

UNIDENTIFIED MALE: Well, as a result of having the old contract, we have the pumps. We basically operate the existing systems currently so we, in turn, make that system run.

UNIDENTIFIED MALE: You've got a fail safe system essentially.

UNIDENTIFIED MALE: (Inaudible). There are certainly things that are sending water there expecting the plant to be there, more critical at the plant end.

At the upper end, it's less critical. If the pumps go down for a certain period of time, well, we can go out and fix them in due time. But at the bottom end, there's an expectation that the bottom end is ready for all this water, so there's a lot of redundancy that's built into the plant alarms by our operators.

UNIDENTIFIED FEMALE: I had a question about the one kind of design that you're considering for the (Inaudible). Is it going to have the same sort of system or are you considering --

UNIDENTIFIED MALE: I think they're

included in it.

UNIDENTIFIED MALE: Yes, that's what the whole point is of trying to focus again on the channels. That's where those things are, in fact, going to be present and that's where, with respect to the final solution and how it is, you had hit on it with respect to the systems operating continuously.

There's a reason why you operate a system continuously and then there's other ways that you can run that system and allow that system to work, you know, run stop, run stop. There's a reason why you would want that particular concept to work, because it's going to do something to allow things to happen within the shallow aquifer and allow you to help mitigate the system quicker.

We're going to be evaluating how -- You know, right now these systems basically run continuously. With respect to developing a source mitigation system, we're changing the perspective of just containment. In other words, we're now changing how things were currently working.

What we want to do is we don't want to just de-water the source area because it's going to effect the containment system, and what we want is actually we want this particular source area to move.

We want to remove the source and then we want flushing to go on through here and then we capture that particular flushing at that particular containment structure so that we're cleaning.

Just by going in and just pumping and pumping and pumping, you're not doing anything with respect to really helping to mitigate things any quicker, so what we're looking at are different techniques that we can operate these particular system under that would allow us to address those other particular concerns.

UNIDENTIFIED MALE: Are you thinking of incorporating ejection wells in your design?

UNIDENTIFIED MALE: No. We've evaluated injection wells because they were in Zone 2.

From an evaluation standpoint, we actually did re-injection tests in Zone 2 because there was, as a part of preferred alternative, injection was, in fact, an alternative that was recommended. It wasn't just the fact that the O and M on ejection wells -- historically we've gone through those people who have built them and those people who are operating them. They're very high cost, they're very high maintenance. In most cases, those particular systems have to be replaced relatively frequently.

UNIDENTIFIED MALE: How frequently, do you have a rough idea?

UNIDENTIFIED MALE: We're talking, what I know of, about five years. That's about the life expectancy of an ejection system. So it's been determined the value that that, in fact, is going to provide, we can essentially, we believe, have basically, by the flushing of that particular shallow aquifer, accomplish the same thing.

And with respect to Zone 2, where it was planned, it technically, in itself, becomes a barrier. I mean, you're changing the shallow aquifer when you're now starting to push water into it so it changes what the current conditions are, what your objective is with respect to what you're trying to do as far as clean-up.

UNIDENTIFIED MALE: Do you have any reason to believe that denapples exist anywhere in the shallow aquifer?

UNIDENTIFIED MALE: I would have to suspect that denapples are TC/PC's. I mean, any of your heavies are --

UNIDENTIFIED MALE: No, I'm talking about emissible phase, liquid TCE.

UNIDENTIFIED MALE: I'd have to contend that it might exist. We haven't been able to

necessarily --

UNIDENTIFIED MALE: There's no evidence of it?

UNIDENTIFIED MALE: I haven't seen any.

UNIDENTIFIED MALE: Do you know of any?

UNIDENTIFIED FEMALE: No, I (Inaudible).

UNIDENTIFIED MALE: Yes, the only project that really is doing the base-wide analytical would be the BRA, and the BRA, as I understand it to date has not uncovered anything of that kind.

UNIDENTIFIED FEMALE: (Inaudible). Has the (Inaudible) actually been determined for all these sites?

UNIDENTIFIED MALE: Yes. Now the ones that were, in fact, that there's source mitigation proposed, and when I indicate source, I think we're confusing. I don't want to confuse ground water source and soils source.

UNIDENTIFIED FEMALE: Right.

UNIDENTIFIED MALE: And with respect to those areas where there's soil contamination present and systems that are being installed in those particular areas, it has been delineated, and that's why it is that the system has, in fact, been proposed in that area.

There was, as a part of initial RD, there

was a significant effort done with respect to trying to delineate obviously the surface extent, the aerial extent of that particular plume with an extensive geoprobe effort, and then there was also another particular effort to vertically determine what the extent of that particular plume was for purposes of designing the system that's proposed to go in.

So there is an air push/pull system that was proposed up in here with capping that was a part of preferred soils alternatives.

There's also another one down here with respect to a push/pull system of air, basically involving an SB system that was proposed associated to this point.

MP had nothing proposed to it because they've never been able to identify any real source material in the media itself. Everything is basically in the water, so it's in the dissolved portion, so there was no source mitigation action taken other than ground water source attack with respect to MP.

So from that standpoint, we're approximating this to be roughly a two year period that we'll have a system in place and in operation.

Now the only factors that we see that have any effect potentially on this is if, in fact,

something brand new, in the process of our doing are particulate testing is something new that was never anticipated, as well as if there's a new technology that would come up.

UNIDENTIFIED MALE: Yes, one of the things that I keep coming back to is the hydrogeological conditions. Everybody seems to be making this assumption but the (Inaudible) is a very homogenous, non-porous, impermeable laying.

As George has pointed out, there are some areas in there which have permeability. Something else I've seen firsthand, particularly in the active zone, is that you develop fractures in the Navarro. Now I know that sounds wild that you can get crack fractures in that clay but what happens is that during the desiccation of that clay under (Inaudible) conditions, you get varying fractures, and then often what will happen is that gypsum will line those fractures and then when the thing closes up during wet periods, the gypsum acts as a prop to keep those open, and I've seen bore holes on the St. Mary's campus where you would have water pouring out of those things. So there are discreet channels through the Navarro. They're hard to find because they are very discreet.

UNIDENTIFIED MALE: I agree, and that's

(Inaudible) channels as well even. And then when you're trying to find those, we have attempted to try to come as close as we can, I agree with what you said. It's very difficult to find these things.

Now the only thing you can do is obviously monitor wells that have been installed to address that kind of contamination to see if, in fact, you find any kind of indication or trace.

At this point obviously, the Edwards is obviously being monitored on a fairly regular basis and there's not been anything, at least with respect to communication with the Edwards, that I'm aware of anyway. But there is certainly always the possibility with respect to false end fractures that something, in fact, would be going on.

UNIDENTIFIED MALE: What is it that's going to be completed in two years? The remedial action says completed in two years, what does that mean?

UNIDENTIFIED MALE: All of the Zone 3 systems.

UNIDENTIFIED MALE: Does that mean you will have everything built in two years?

UNIDENTIFIED MALE: That's exactly right.

UNIDENTIFIED FEMALE: And by that time, you'll be able to predict how long the actual clean-up

will take, right?

UNIDENTIFIED MALE: At that point, we'll be monitoring exactly how well the system is performing and evaluate just exactly how quickly it's cleaning.

UNIDENTIFIED MALE: That's another good thing in terms of this quick period of optimizing the systems and putting the final fixes in place is during this very short period of time, you'll have a baseline model that's there, and it's a very good baseline model and it's been done during a very specific period of time so that it's all integrated together and can then be updated throughout.

UNIDENTIFIED MALE: Anything else?

UNIDENTIFIED MALE: Thank you very much. That was a great presentation. Thanks everyone for coming.

I just want to say one thing with regard to Zone 3 clean-up.

Miscommunication occurred. The things that some of us were asking for was clean-up of contaminated ground water in the zone, in the O'Connor Road neighborhood. So, you know, let's have another one of these soon, I hope, to discuss that. Thank you.

UNIDENTIFIED MALE: Thanks everyone.

(End of tape.)

THE STATE OF TEXAS)

COUNTY OF BEXAR)

REPORTER'S CERTIFICATE

I, LYNNE M. RODRIGUEZ, a Certified Shorthand Reporter in and for the State of Texas, do hereby certify that this transcript is as true and correct a record as possible, transcribed from an audio recording, of the proceedings recorded herein.

I further certify that I am neither attorney nor counsel for, nor related to, nor employed by any of the parties to the action in which this testimony was taken. Further, I am not a relative of any attorney of record in this cause, nor do I have a financial interest in this action.

SUBSCRIBED AND SWORN to on this the 24th day of September, 2007.

Lynne M. Rodriguez
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Certification No. 8640

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